IBM Tealeaf CX
Version 9.0.1
December 4, 2014

Configuration Manual

Note
Before using this information and the product it supports, read the information in "Notices" on page 405.

This edition applies to version 9, release 0, modification 1 of IBM Tealeaf CX and to all subsequent releases and modifications until otherwise indicated in new editions.

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Tealeaf CX Configuration Manual

The IBM Tealeaf CX Configuration Manual details how to configure the IBM Tealeaf CX system after you have completed the installation and on an on-going basis. Use the links below to access specific topics in the manual.

- This manual should be used after you have completed an installation or an upgrade. For more information on installation, see "Tealeaf CX Installation Manual" in the *IBM Tealeaf CX Installation Manual*.

  Note: If you are upgrading an existing Tealeaf solution, please use the Upgrade Manual. See "Tealeaf CX Release 8 Upgrade Manual" in the *IBM Tealeaf CX Upgrade Manual*.

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Chapter 1. Overview of CX Configuration

This document provides topics on how to configure your IBM Tealeaf CX solution in the following three categories.

Initial Configuration

After you have finished the installation of IBM Tealeaf CX products, you may review individual topics on how to configure individual Tealeaf products.

• See Chapter 3, “Initial CX Configuration,” on page 159.

Configuring Servers and Services

As part of the initial configuration, the following servers and services are configured. From time to time, you may need to alter these configurations. See Chapter 2, “Configuring Tealeaf Components,” on page 3.

These configurations can be managed through the Tealeaf Management System. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring the CX Pipeline

The IBM Tealeaf CX pipeline enables processing actions to be performed on the individual requests and responses of each hit that is captured by Tealeaf. Individual session agents can be added and configured in one or more pipelines, enabling precise manipulation of captured data.

• See “Overview of the Capture Pipeline and Session Agents” on page 224.

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Chapter 2. Configuring Tealeaf Components

This section provides information on individual Tealeaf services, servers, configurations, and standalone applications that are part of the IBM Tealeaf CX system. You can use the links below to access configuration documentation for the listed Tealeaf component.

- For more information on the rows in each table, see "Legend."
- For more information on general configuration of IBM Tealeaf CX including the initial configuration steps for each Tealeaf product, see Chapter 1, "Overview of CX Configuration," on page 1.

Event Model Backup

Before you begin modifying your event definitions, you should perform a backup of your Tealeaf event model, which can be used to restore event definitions to a previously known state. See "Event Model Backup and Restore" in the *IBM Tealeaf cxImpact Administration Manual*.

Legend

- **Description:** description of the component
- **Services Panel:** Entry in the Windows Services Control Panel, if applicable
- **Portal Management:** Entry in the "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*, if applicable
- **TMS:** Entry in the "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*, if applicable
- **Docs:** Links to configuration documentation

Services

Note: Avoid using the Windows Services Control Panel to stop and restart Tealeaf Services. Use the shortcuts inserted into the Start menu instead.

Alert Service

Description
Manages execution and delivery of event-based alerts

Services Panel
Tealeaf Alert Service

Portal Management

TMS Alert Service

Docs "Configuring the Alert Service" on page 141

Canister Manager

Description
This service controls and monitors the canister and Tealeaf Canister Server processes. Canister Services are restarted by the Canister Manager when an error condition is detected.

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Services Panel
Tealeaf Canister Manager

Portal Management

TMS Canister

Docs

Data Collector

Description
Service queries Tealeaf Canisters and aggregates data for storage into the Tealeaf databases

Services Panel
Tealeaf Data Collector

Portal Management

TMS Data Collector

Docs "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*

Data Service

Description
Connection manages between Tealeaf services and the databases they query

Services Panel
Tealeaf Data Service

Portal Management

TMS

Docs "Configuring the Tealeaf Data Service" in the *IBM Tealeaf CX Configuration Manual*

Extract Service

Description
Service used by IBM Tealeaf cxConnect for Data Analysis to extract session data from Tealeaf databases

Services Panel
Tealeaf Extractor Service

Portal Management

TMS Extract Service

Docs “Configuring the Extract Service” on page 156
"cxConnect for Data Analysis Administration Manual" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*

Portal GUI

Description
Service that stops, starts, and restarts Microsoft IIS, which hosts the Portal application

Services Panel

Portal Management

TMS Portal GUI

Docs

Query Server

Description
Manages communication between the Portal and the Visitor database. Embedded in the RSE Service.

Services Panel

Portal Management

TMS

Docs "cxResults Administration Overview" in the *IBM Tealeaf cxResults Administration Manual*

RSE Service

Description
Service analyzes session data to create segments

Services Panel

Portal Management

TMS RSE Extractor Service

Docs

- "RS Extractor Settings" in the *IBM Tealeaf cxImpact Administration Manual*
- "cxResults Administration Overview" in the *IBM Tealeaf cxResults Administration Manual*

Session Indexer

Description
Indexes completed sessions stored in the Canister on the same Processing Server

Services Panel
Tealeaf Session Indexer

Portal Management

TMS Session Indexer

Docs “Configuring CX Indexing” on page 33

Scheduling Service

Description
Manages schedule and execution of Tealeaf jobs including backups, extractions, and Portal Status reporting

Services Panel
Tealeaf Scheduling Service

Portal Management

TMS Scheduling Service

Docs "Configuring the Scheduling Service" in the *IBM Tealeaf CX Configuration Manual*

Tealeaf Status

Description
Status information on configured Tealeaf components and services

Services Panel

Portal Management

TMS

Docs

- "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*
- "Configuring the Scheduling Service" in the *IBM Tealeaf CX Configuration Manual*

Tracking Service

The Tracking Service receives session logging data from the Replay Server and provides an API to query the logs. Portal queries the tracking service through the Data Service to obtain the logs.

Description
When enabled, the Tracking Service supports Replay Server logging in BBR so that logging information displays in the Processing window when sessions are loaded.

Users with Administrative authorization can expand the Processing window to get a real-time view of the logs from the rendering engine.

Services Panel
Tealeaf Tracking Service

Portal Management
Replay Server

TMS Tracking Service

Docs

- Configuration: Configuring the Tracking Service
- Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*
- Configuring Pipelines: "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*

Transport Service

Description
Receives session data from the PCA Server and initiates and manages Windows pipeline operations

Services Panel
Tealeaf Transport Service

Portal Management
Transport Server

TMS Transport Service

Docs

- Configuration: “Configuring the Transport Service” on page 15
- Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*
- Configuring Pipelines: "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*

Servers

Canister Server

Description
Capture and storage of active and completed sessions; indexing of completed sessions for search. Also known as the Processing Server, which is functionally equivalent to the ctree database.

Services Panel
Tealeaf Canister Server

Portal Management
Canister Server

- When a Canister Server reference is created in the Portal Management, a reference to the Search Server on the Canister is automatically created, too.

TMS Canister Server

Docs Configuration: “Configuring the CX Canister” on page 18
Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*

cxConnect Server

Description
Manages extraction of session data for delivery to third-party systems

Services Panel

Portal Management
IBM Tealeaf cxConnect for Data Analysis Server

TMS IBM Tealeaf cxConnect for Data Analysis Server

Docs Configuration: "cxConnect Installation" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*
Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*

cxReveal Server

Description
Receives session attribute information from the Canister via Event Bus for insertion into the IBM Tealeaf cxReveal Search database.

Services Panel

Portal Management
IBM Tealeaf cxReveal Database Search Server

TMS Separate server

Docs

- Installation: "cxReveal Installation" in the *IBM Tealeaf cxReveal Administration Manual*
- Configuration: "Configuring Session Attribute Search" in the *IBM Tealeaf cxReveal Administration Manual*
- Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*

Data Service Server

Description
Manages communications between Tealeaf components and the databases

Services Panel
Tealeaf Data Service

Portal Management
Data Service Server

TMS Data Service

Docs Configuration: "Configuring the Tealeaf Data Service" in the *IBM Tealeaf CX Configuration Manual*

PCA Server

Description
Portal definition for the machine hosting the IBM Tealeaf CX Passive Capture Application

Services Panel

Portal Management
Capture Application Server

TMS PCA Server

Docs PCA Configuration: "PCA Web Console - Delivery Tab" in the *IBM Tealeaf Passive Capture Application Manual*
Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*

Replay Server

Description
Manages the replay of sessions through the Portal (BBR)

Services Panel
Tealeaf Replay Server

Portal Management
Replay Server

TMS Replay Server

Docs Configuration: “Configuring the Replay Server” on page 69
Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*

Report Server

Description
Manages queries to other servers in the Tealeaf environment

Services Panel

Portal Management
Report Server

- When a reference to the Report Server is created in the Portal Management page, a reference to the Search Server instance on the server is also created.

TMS

Docs Configuration: “Configuring the Report Server” on page 58
Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*

Search Server

Description
Manages searches of active and completed session data, among other functions

Services Panel
Tealeaf Search Server

Portal Management

TMS Search Server

Docs “Configuring the Search Server” on page 107
Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*

SQL Server

Description
Microsoft SQL Server product is required host of Tealeaf databases

Services Panel
MSSQLSERVER

Portal Management

TMS

Docs "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*

Tealeaf Management Server

Description
Manages TMS

Services Panel
Tealeaf Management Server

Portal Management

TMS Tealeaf Management Server

Docs "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*

TLI Server

Description
Manages the storage of static content

Services Panel

Portal Management
TLI Server

TMS

Docs

- Configuration: "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*
- Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*
- User: "Using Static Archives in RTV" in the *IBM Tealeaf RealiTea Viewer User Manual*

Transport Server

Description
Additional instances of the Transport Service can be deployed as Health-Based Routing (HBR) devices.

Services Panel
TeaLeaf Transport Service

Portal Management

TMS Transport Service

Docs

- "Configuring the Transport Service" on page 15
- "Health-Based Routing (HBR) Session Agent" on page 263

Visitor Report Server

Description
Server that hosts the Query Server communicating with the Visitor database

Services Panel

Portal Management
Visitor Report Server

TMS

Docs Portal Management: "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*

Configuration

Tealeaf mail configuration

Description
Configure mail server used by Tealeaf

Services Panel

Portal Management

TMS Tealeaf > Tealeaf mail configuration information

Docs "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*

Shared configuration

Description
Configuration settings shared by multiple servers and services

Services Panel

Portal Management

TMS Tealeaf > Shared configuration information

Docs "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*

Tealeaf global configuration

Description
Global configuration settings

Services Panel

Portal Management

TMS Tealeaf > Tealeaf global configuration settings

Docs global: "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*
System Timezone: “Configuring the System Timezone” on page 12

Pipeline Editor

Description
Configure Windows pipelines through the TMS Pipeline Editor

Services Panel

Portal Management

TMS Transport Service > Transport Service configuration

Docs "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*

Privacy Filter

Description
Configure filtering of data in the Windows pipeline.

Services Panel

Portal Management

TMS Transport Service > Privacy Filter configuration

Docs “Privacy Session Agent” on page 291

Application

RTV

Description
IBM Tealeaf CX RealiTea Viewer desktop application to search and replay Tealeaf sessions.

Services Panel

Portal Management

TMS IBM Tealeaf CX RealiTea Viewer

Docs "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*

RTV Pro

Description
IBM Tealeaf CX RealiTea Viewer Professional desktop application to search and replay Tealeaf sessions.

Services Panel

Portal Management

TMS IBM Tealeaf CX RealiTea Viewer Pro

Docs "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*

TLBackup and TLRestore

Description
Configure and execute scheduled backup and restore Canister operations

Services Panel

Portal Management

TMS

Docs "TLBackup and TLRestore" in the *IBM Tealeaf cxImpact Administration Manual*

TLTMaint

Description
Examines and repairs Canister for data consistency

Services Panel

Portal Management

TMS Canister > TLTMaint

Docs

Configuring the System Timezone

Tealeaf® requires that a single time zone be defined across all Tealeaf servers in the system. For some Tealeaf operations such as searching, the time zone may change the meaning of parameters such as `today` or `yesterday`. Among other features, this system-wide time zone is used as the basis for determining when scheduled reports are executed and delivered.

Note: Tealeaf supports all Coordinated Universal Time (UTC) formatted time zones. The use of a time zone that is not defined as standard Coordinated Universal Time (UTC) time zone is not supported.

- All time zone values for Tealeaf components and applications are calculated from the system time zone, except for Search Server. All sessions and canister data are stored using GMT timestamps, so no timezone references are needed for Search Server. See “Configuring the Search Server” on page 107.

- Individual users may set their local time zone. A user's time zone primarily affects searching for data. See "My Settings" in the *IBM Tealeaf cxImpact User Manual*.

Note: For time zones that include Daylight Savings Time during the year, reporting values when the hour jumps forward show a gap of one hour while values when the hour jumps backward result in double-counts. Tealeaf administrators can use Portal Announcements to notify users of the time change and its effects. See "Portal Announcements" in the *IBM Tealeaf cxImpact Administration Manual*.

Note: During the installation process, the system time zone should be carefully considered and selected. After changing the system time zone on an actively processing Tealeaf system, some data may be lost when the next trimming of the canisters is performed. The volume of potentially lost data is the number of hours by which the time zone was shifted.

Time Zone Indicator

Depending on your version of Windows, the Portal may display the time zone indicator using one of the following acronyms. These indicators are present in the time zone displayed in the upper-right corner of the Portal and are present in any saved time zone data.

Note: Functionally, these time zone indicators identify the same zones around the globe.

Acronym	Description
UTC	Coordinated Universal Time is a more precise time zoning mechanism than GMT. This method is used in more recent versions of the Windows operating system.
GMT	Greenwich Mean Time indicates your time zone with respect to the Greenwich meridian. This method is more prevalent in older versions of the Windows operating system.

Current Time Zone

User

The time zone for the user currently logged into the Portal is displayed in the toolbar, relative to the Tealeaf system time zone. For example, GMT-7 is the time zone seven hours behind Greenwich Mean Time, which corresponds to the U.S. Pacific time zone.

Global

The global system time zone is specified and available through TMS. See “Configuring the System Time Zone” on page 14.

Effects of System Time Zone

The configuration of the system time zone has the following behaviors:

1. All reporting data is assigned a timestamp based on the global system time zone.
   - For reporting purposes, a day and its hourly buckets are defined by the midnight-to-midnight interval in the global system time zone.

2. Event timestamps are recorded when the event occurred. Events may occur at the beginning of a session, on individual pages, and at the end of a session.
   - This precise timestamping improves the event count calculations, which are performed on an hourly basis.
   - If the session spans two hourly buckets, the events of the session may be spread across two different intervals.

     Note: Since events are recorded at the time they occurred, you may sense mismatched counts in events if you are searching for a session that ends in a different hour. For example, if the event fires at 11:55 and the session ends at 12:05, search drilldowns look for sessions in the 11-12 bucket yet won't discover the specific session, which ended in a different hour. Reporting data is more accurate, but drilldowns may show discrepancies.
   - See "Tealeaf Event Manager" in the *IBM Tealeaf Event Manager Manual*.
3. All completed sessions are still indexed at GMT. Tealeaf session and index data are aggregated on a daily basis, based on the GMT day.
   - During search operations, Tealeaf Search Server applies a time zone offset so that returned session data applies to your local time zone.

Configuring the System Time Zone

During installation, the time zone is defined as the current time zone of the install machine.

- For Tealeaf solutions in which all Tealeaf servers are located in the same time zone, a configuration change may not be required.
- Since Daylight Savings Time is shifted at 2am, no daily data is lost by shifting the time one hour forward or backward.

For a multiple-machine implementation that spans multiple time zones, all machines must roll at the same time. For example, if the processing server is in New York and another processing server is in Los Angeles, you must decide and configure a single time zone that both machines recognize. Otherwise, operations such as searching within a specific time period can produce incorrect results.

Note: All Tealeaf servers must be configured to use the same roll time zone. Failure to synchronize on the same time system time zone can cause unpredictable behaviors.

The System time zone can be changed using the Tealeaf Management System (TMS).

To configure the system time zone:

1. Login to the Portal as an admin user.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. In the Servers view, select the desired server to drill down to components.
4. Select the Tealeaf component to display the configurations.
5. Double-click **Tealeaf global configuration settings** to open the Config Info dialog.
6. Click **Edit**. The Configuration Editor is displayed.
7. Click **Roll Time Zone**. Select the desired time zone from the list and then click **Apply**.
8. Enter a description for the change in the Version Description field, and click **Save** to save the changes.

9. If prompted to add tasks to push the new configuration, select all servers and click **OK**.
10. To push the configuration change to the selected server, click **Submit**.

Troubleshooting

For more information on troubleshooting, see "Troubleshooting - Infrastructure" in the *IBM Tealeaf Troubleshooting Guide*.

Configuring the Transport Service

The Transport component is responsible for accepting hits from the Capture Server, performing a series of pipeline operations, and then delivering the hit to the Processor component.

- Pipeline operations are managed by a configurable sequence of session agents. See Chapter 4, “CX Pipeline Session Agents,” on page 213.
- The Processor component can be installed on the same machine as the Transport component, or it can be installed on a separate machine.

Note: While configuration of this Tealeaf component can be completed at the command line by editing a file stored on each Tealeaf server, the recommended approach is to make configuration changes through the Tealeaf Management System, which allows you to make edits in one place and to apply the configuration changes to multiple servers. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Accessing Transport Service Configuration

To configure Transport Service:

1. Login to the Tealeaf Portal as an administrator.
2. In the menu, select **Tealeaf** > **TMS**.
3. The Tealeaf Management System is displayed. For more information on how to use TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
4. In the View drop-down, select **Servers**.
5. Click **Transport Service**. The following nodes are displayed:
   - **“Transport Service Configuration” on page 16** - Configure the Windows pipeline through the Pipeline Editor. See “Transport Service Configuration” on page 16.
   - **Privacy Filter configuration** - Configure the Windows Privacy session agent, which can be used to remove, mask, or encrypt, or otherwise manipulate sensitive data that is included in the hit. See “Privacy Session Agent” on page 291.
     – There is also an extended version of this session agent. See “Extended Privacy Session Agent” on page 261.
   - **DataParser Search Templates** - Configure the search patterns and rules for the Data Parser. See “Data Parser Session Agent” on page 246.
   - **RTA configuration** - Real-time processing on each captured hit. See “Real-Time Monitoring and Alert (RTA) Session Agent” on page 321.

Enabling SSL Transport with Passive Capture Application

If needed, you can generate SSL keys and use them to enable encrypted transport between the IBM Tealeaf CX Passive Capture Application and the Transport Service.

Note: SSL transport requires additional processing and may impact overall throughput.

See "SSL Key Operations" in the *IBM Tealeaf Passive Capture Application Manual*.

Transport Overview

The installer creates the default pipeline operations. The default pipeline operations are listed in the order of execution:

```
DataDrop > DecoupleEx > Inflate > PrivacyEx > TLTRef > SessionRouter >
  Canister (or Socket)
```

- If a Processor component has been installed on this machine, then the pipeline is terminated with the Canister pipeline agent.
- If the Processor component is installed on a different machine, this pipeline is terminated with the Socket agent.

This pipeline can be modified to include or exclude other operators. Each available pipeline operator and its options are described in more detail in the Pipeline Session Agents chapter. See Chapter 4, “CX Pipeline Session Agents,” on page 213.

Transport Service Configuration

Through the Pipeline Editor in TMS, you can configure the structure and sequencing of the main and child pipelines in the Transport Service.

1. In TMS, click the Transport Service node.
2. Click **Transport Service configuration**.
3. In the Config Actions panel, click **View/Edit**.
4. The current Transport Service configuration is displayed in the Pipeline Editor. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

Monitoring the Pipeline

You can monitor the activities in the pipelines you create through the Pipeline Status tab in TMS. See "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Transport Service Configuration at the Command Line

At the command line, Transport configuration is completed in the file `TeaLeafCaptureSocket.cfg`:

- You can open this file through the Windows Start menu:

  ```
  Start > Programs > TeaLeaf Technology > TeaLeaf CX Capture >
    Configuration Files > Socket Capture Configuration
  ```

- This file is a Windows `ini` format file, where each section represents a pipeline operation. For more information on how to configure, you can review the file itself.

Note: When making a change to the `TeaLeafCaptureSocket.cfg` file, you must restart the Tealeaf Transport Service to make the changes take effect. It is recommended that you make changes through TMS, which maintains version control.

Troubleshooting

For more information on troubleshooting, see "Troubleshooting - Pipeline" in the *IBM Tealeaf Troubleshooting Guide*.

Configuring the Tracking Service

You can set and modify the configuration for the Tracking Service component by using TMS.

The Tracking Service component is responsible for tracking Replay Server logging information and delivering the logging data to Browser Based Replay (BBR).

The Tracking Service must be installed and configured if administrators want access to real-time page load logging information in BBR.

Note: Although you can configure the Tracking Service component at the command line by editing a file stored on each Tealeaf server, the recommended approach is to make configuration changes through the Tealeaf Management System, which allows you to make edits in one place and to apply the configuration changes to multiple servers. See the *IBM Tealeaf cxImpact Administration Manual* for information about the Tealeaf Management System.

Note: Any changes you make to the Tracking Service require that you restart it, as well as restarting the Replay Server and the Data Service.

Editing the Tracking Service configuration using TMS

You can access and edit the Tracking Service configuration by using TMS.

To access and edit the Tracking Service configuration using TMS:

1. Login to the Tealeaf Portal as an administrator.
2. From the menu bar, select **Tealeaf** > **TMS**.
3. From the World View panel, select **Servers** from the list of Views.
4. From the list of servers that display, expand the server on which the Tracking Service is installed.
5. Expand the **Tracking Service** node and select **Tracking Service Configuration**.
6. In the Config Actions window, click **View/Edit**.
7. From the Tracking Service Configuration window, click **Enable Tracking** to access the Edit Config Item dialog box.
8. Select **Yes** from the drop down list to enable the Tracking Service or select **No** to disable it.
9. From the Tracking Service Configuration window, click **Tracking Service URL** to access the Edit Config Item dialog box.

   You can edit the Tracking Service URL to point to a different server.

If you make changes to the Tracking Service configuration, you must restart it.

Also, because the Tacking Service configuration gets applied to the common registry used by IBM® Tealeaf servers, after you make changes to the Tracking Service, you must restart the Replay Server and the Data Service. Restarting the Replay Server and the Data Service enables them to pickup the new registry keys from the changed configuration.

Configuring the CX Canister

After installation, you may need to perform additional configuration of the IBM Tealeaf CX Canister for single server or multi-server installations. Changes to these settings can be used to deploy the IBM Tealeaf CX Canister and indexing functions across multiple servers, or you can install multiple Canisters on the same machine or across multiple machines.

Configuration of the IBM Tealeaf CX Canister is managed through the Tealeaf Management System, which also manages configurations for other Tealeaf components. It can be used to view and edit the configuration of IBM Tealeaf CX Server either on the local computer or on a remote computer. This section describes how to use TMS to manage IBM Tealeaf CX Canister configurations.

- For more general information about TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Note: The `ctsrvr.cfg` file in the Tealeaf installation directory contains a `LOCAL_DIRECTORY` setting that defines the root directory for the Canisters. The names of the Canister directory are specified as paths relative to `LOCAL_DIRECTORY`, in the Location of Canister section of Canister Configuration. Do not define `LOCAL_DIRECTORY` to be the root directory of a volume, such as `C:`.

To view or edit canister configuration settings:

1. Log in to the Portal as an admin user.
2. From the **Portal** menu, select **Tealeaf** > **TMS**.
3. In the Servers view, click the next to the desired server to drill down to components.
4. Click the next to the **Canister** component to display the configurations.
5. Click **Canister configuration** to display the Config information.
6. Click **View/Edit**. The Configuration Editor is displayed.

The following configuration option tabs are available for the canister configuration by using TMS.

Canister Overview

The Tealeaf Canister consists of two databases designed for the capture, evaluation, and storage of Tealeaf session data.

- **Short Term Canister:** This in-memory database is used to store hits forwarded to the Canister from the Transport Service or Health-Based Routing session agent. For each session, each hit is added to the STC, associated with the other hits of the session, and evaluated for events. When the session is closed, it is moved to the Long-Term Canister.
- **Long-Term Canister:** When a session is closed, it is written to a disk-based database called the Long-Term Canister. These disk-stored sessions are then indexed for search.

Canister Processes

The canister processor consists of a manager process: `TlCanMgr.exe`. This process manages four types of worker processors:

- `TLEventProc.exe` processes evaluate hits for events.
- `TLSesnCloser.exe` process evaluates expired sessions for session-level events.
- `TLSesnArchiver.exe` processes prepare and store sessions.

- `TLEventBus.exe` processing event placed in the event bus queue.

Note: To stop and restart the Canister Manager, use the Start menu shortcuts under the IBM Tealeaf CX Portal heading. The Start menu shortcut executes `CanSvcs.exe`, which manages the flow of hits into the canister and spooling operations. Using the Windows Services Control Panel to stop and start the Canister Manager may cause data loss.

Canister Security

Canister ports

Tealeaf Canisters require two open ports. By default, these ports are the following:

Port	Description
5597	Enables SQL communications between the Portal application and the Canisters using the Canister native libraries. This port supports Tealeaf processes such as the Data Collector, Canister Manager, and other session agents. **Note:** This port is secured using the `TLUSER` or `ADMIN` account and its password, which you specify in the Portal Management page. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.
19000	Enables communications between the Search Server and the Canister for queries for session information. There are two types of communications: • Read-only: Queries for Canister status information from Tealeaf processes such as Canister status, Governor status, and others. These do not require authentication. • Data manipulation: Queries for session data or to execute a command on the Canister. **Note:** To enable authentication for data manipulation operations on the Canister, NT authentication must be enabled. See "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

See "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*.

Session data

On the Canister disk, session data is encrypted using 3DES encryption. See "Tealeaf Encryption Standards" in the *IBM Tealeaf cxImpact Administration Manual*.

UNC Paths

Use of UNC paths is supported in configuring Tealeaf Canisters.

Note: For the Processing Server (Canister), you must install locally and then insert the UNC paths into the Canister configuration after the installation has completed.

Applying Canister Configuration Changes

Since the Canister is a high-performance component integrated into the capture and processing stream, changes should be applied with care. When applying the changes to the Canister, select `Add Restart Task(s)` only when changing the number of Hit and Session processors:

- Services Controls tab - `Hit Processors`
- Services Controls tab - `Session Processors`

When these settings are changed, a restart of the Transport Service is also required because the Canister Manager requests the Transport Service to start spooling of the data stream.

Note: After modifying Canister settings and restarting the Transport Service, hits may be spooled until the Canister is up and running. In some situations, the Extended Decoupler session agent does not receive notification that the Canister has restarted, and hits continue to be spooled even though the Canister is ready to receive them. In this case, a restart of all Tealeaf services is required.

- Restarting the Transport Service restarts the flow of the data stream. See "Configuring the Transport Service" on page 15.

Canister Services Tab

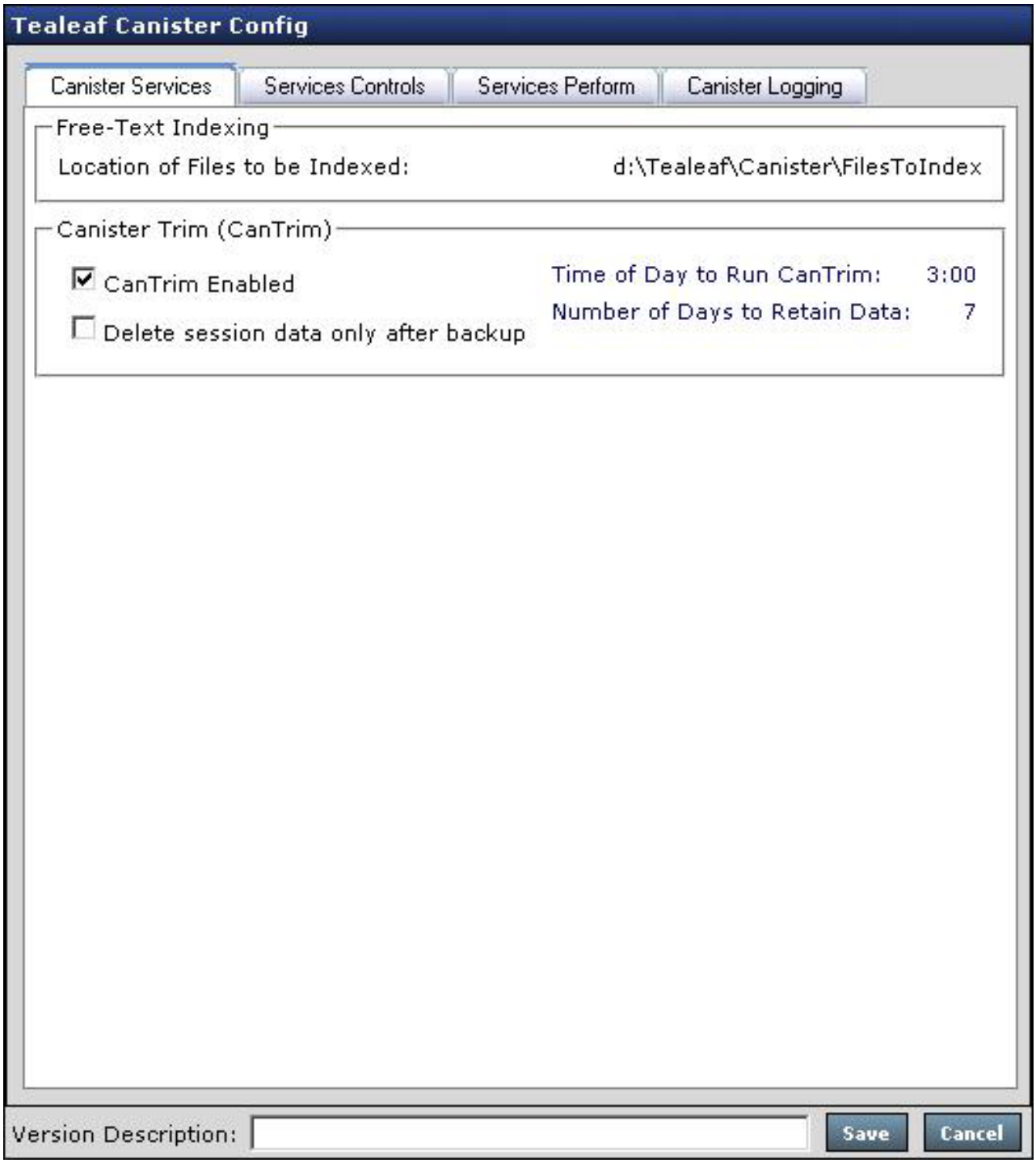


Figure 1. Canister Services Tab

Free-Text Indexing

For indexing purposes, sessions are pulled directly from the canister.

Setting Description

Location of Files to be Indexed
When pulling data from the Canister, Tealeaf Indexing Service uses the specified directory to store its job files.

Canister Trim (CanTrim)

CanTrim keeps sessions in the Long Term Canister for the number of days specified and deletes session data older than the number of days specified. For example, if you have specified seven days for CanTrim, it will keep seven days worth of sessions and delete any session data older than seven days. CanTrim deletes both the `LSSN*.dat` files and `LSSN*.idx` files. It also sends a message to the Session Indexer to delete the corresponding dtSearch indexes.

Note: When using CanTrim to remove sessions from the Long Term Archive, deleted session statistics are still displayed in the Portal's charts and report summaries.

Setting Description

CanTrim Enabled
Enables trimming of session data.

Time of Day to Run CanTrim

Note: Choose an off-peak time to trim session data from all active canisters.

Delete session data only after backup
Instructs CanTrim to delete only those day Canisters that have a cleared archive bit, which are all sessions older than the specified number of days. If you run Backup before CanTrim, deselect this value so CanTrim can remove sessions. If you leave this selected without running Backup, CanTrim never deletes any sessions, and the Long Term Canister continues to grow in size.
If this option is selected, when CanTrim is executed, you may see the following errors in the log:

```
03/25/12 00:40:58|DeleteLSSNDataFile: Skip trimming data file
CANISTER.dbs\LSSN_<date>_<servername>.dat, archive bit is set
```

These errors indicate that sessions could not be trimmed because they had not yet been archived. You may need to configure your backup job to occur before the CanTrim operation is scheduled to execute. See "TLBackup and TLRestore" in the *IBM Tealeaf cxImpact Administration Manual*.

Number of Days to Retain Data
The number of days of data in the Long Term Archive should not exceed your hard disk space.

Note: This setting should be configured in conjunction with Backup, which backs up Canister, Report, and Index files. For example, if you want to back up every day, set `CanTrim` to delete session files every other day.

Configuring the Number of Days to Retain Session Data

For each Canister, session data is stored on the local drive of each Canister in the location specified by `LOCAL_DIRECTORY` in the Canister Server configuration. By default, Tealeaf is configured to retain completed session data in each Canister of your environment for seven (7) days.

Note: Canister data is stored on the designated disk on the Canister (Processing Server). It is not stored in a SQL Server database.

Note: When data has aged beyond the maximum permitted days of retention, the next Canister trimming operation removes the data from the local drive. Unless the data has been archived or backed up to another location, it is permanently removed from access.

If needed, you can change the number of days of data that are retained in each Canister in your environment. Please use the following steps to verify available space and change the days retained of Canister data accordingly.

Note: Do not use these steps to change the location of where session data is stored on each Canister. That process involves several additional steps and should be completed with Tealeaf assistance. For more information, please contact Tealeaf http://support.tealeaf.com.

Note: Before you begin, you should back up each Canister whose retention days you are changing. See "TLBackup and TLRestore" in the *IBM Tealeaf cxImpact Administration Manual*.

Accessing Management System:

Access Tealeaf Management System:

1. Tealeaf > TMS. The Tealeaf Management System is displayed.
   - See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
2. Click the WorldView tab.
   - See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Select `Servers` from View drop-down.
4. Perform the following steps for each Canister in your Tealeaf environment.

Processing Canisters:

1. Click the server hosting one of your Canisters.
2. Click the Canister Server node.
3. Click **Canister Server configuration**.
4. Click **View/Edit**. The Canister configuration dialog opens.
5. Expand the **Default** node.
6. Look at value for `LOCAL_DIRECTORY`.
7. Check the space available on this volume. Before you change the days to retain, you should verify that you have sufficient space to retain the data if you are increasing it.

   Note: Typically, this volume is the same as where the Canister is located, but you should verify.
8. If sufficient space is available, you can change the value for `Number of Days to Retain Data`. This value defines the number of days that session data is retained in the Canister. When data is aged longer than this value, data trimming operations in the Canister remove it permanently.
   a. Click the Canister node, which is a different node in Server view.
   b. Click **Canister configuration**.
   c. Click **View/Edit**. The Canister configuration dialog opens.
   d. Click the Canister Services tab.
   e. The setting to change is `Number of Days to Retain Data`.

f. If increasing the number of days of retention: try increasing a small amount first to see the impact on available space in your volume.

g. If decreasing the number of days of retention:

Note: If you are lowering the number of days of data retained, the next canister trimming operation removes data that is now identified to be older than the newly designated number of days to retain. Never set this value below 2.

9. Click **Save**.
10. Submit the task and run the job immediately.
11. Repeat the above steps for each Canister in your Tealeaf environment.

Services Controls Tab

In the Services Controls tab, you can configure how numerical values are treated, the number of processing threads to use, and the amount of memory on the Processing Server reserved for the Short Term Canister.

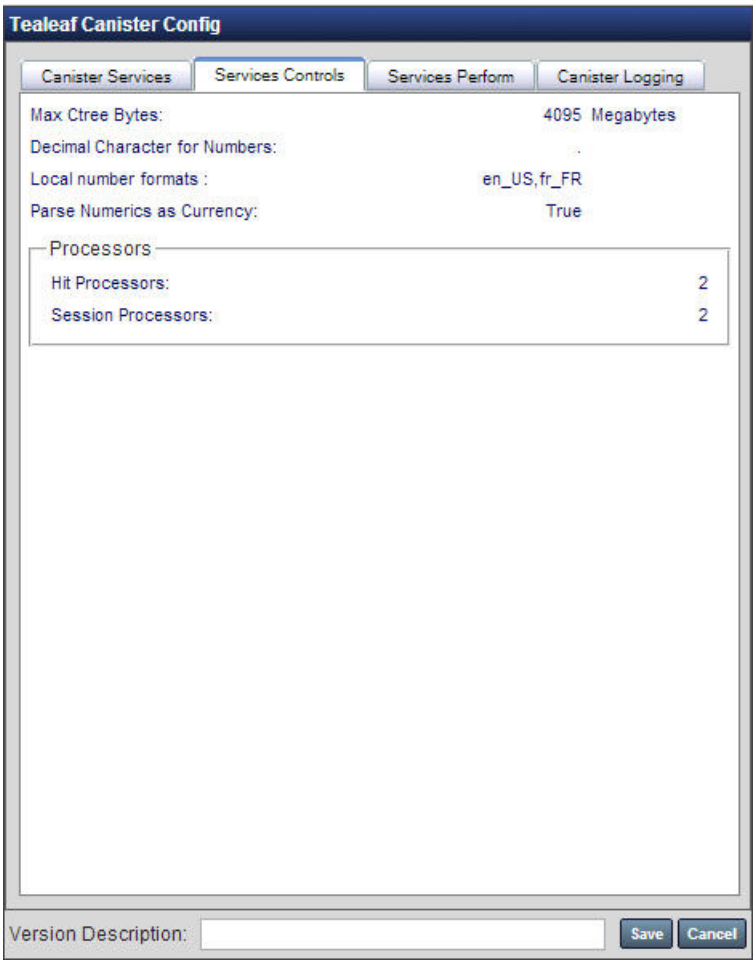


Figure 2. Services Controls Tab

Setting Description

Max Ctree Bytes
Specifies the amount of memory to allocate to the Tealeaf Canister Server. The amount of memory is calculated at installation depending on available physical memory.

Decimal Character for Numbers (deprecated)
For numeric values, you may specify the character to use as the decimal separator. You can choose between `.` and `,` By default, this value is set to `.` This setting is ignored if `Local number formats` is specified.

Local number formats
A comma-separated list of names of local number formats in IETF BCP 47 format, such as `en-US` or `fr-CH`, to be used when parsing numeric hit attributes.

If this setting is not specified, Tealeaf uses a default list of two formats. The first format uses the setting for Decimal Character for Numbers as a decimal separator and the alternative as a thousands separator. The second format uses the reverse.

Note: IBM Tealeaf first tries to parse the numbers in each local format by requiring that the number be formatted exactly as expected. Tealeaf then tries to parse the numbers again for each locale in a mode that ignores missing or misplaced thousands separators. This can have unexpected results. For example, `123456.78` parses successfully as `12,345,678` in the `fr-FR` locale.

Events that extract machine-readable (no thousands separator, `.` as decimal separator) numbers (such as from JSON or XML data) should be written as custom events, parse the hit attribute in JavaScript code, and call `setFact()` with the numeric value rather than a string. By doing this, they work independent of **Local number formats**.

Parse Numerics as Currency
When set to `True`, numeric values that are detected in session data are treated as currency values. These values are rounded to two decimal points of precision, and the `Decimal Character for Numbers` is applied.

Processors

Use these controls to configure the processing threads used to evaluate hits and sessions in the Canister.

Note: For each Canister, there is rarely a need to increase the total count of hit and session processors above 8. Increasing the number of processors above this soft limit can have significant impacts on system performance and can cause spooling and potential data loss.

Setting Description

Hit Processors
Specifies the number of processes to allocate for hit event evaluation in the Tealeaf Canister Server. If the Decoupler Status is reporting spooling because of high unevaluated hits, increasing the number of hit processors alleviates this condition. The default value is `2`.

Note: To apply changes to this value, a restart of the Transport Service is required. See "Configuring the Transport Service" on page 15.

Session Processors
Specifies the number of processes to allocate for session archival in the

Tealeaf Canister Server. If the Decoupler Status is reporting spooling because of high sessions waiting for archival, increasing the number of session processors may this condition if excess I/O throughput is available. One of the primary functions of the session processor is to compress sessions for storage, which increases the rate at which sessions are ready for writing to disk. The default value is 2.

Note: To apply changes to this value, a restart of the Transport Service is required. See “Configuring the Transport Service” on page 15.

Canister Safety Limits

Tealeaf provides a set of controls to set the maximum size of a session in terms of hits, bytes, or duration. These controls can be configured through Advanced Mode in the Event Manager.

- See "Tealeaf EES Tutorial" in the *IBM Tealeaf Event Manager Manual*.

Services Perform Tab

This tab provides controls for various timeout settings in the canister. You may also enable the Event Bus through this tab. See "Tealeaf Event Bus" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

Figure 3. Services Perform Tab

Setting Description

`Session Idle Seconds`

Specifies that if no hits arrive in a session for the number of seconds specified, the session is marked as closed, and no further hits are added to it. If more hits arrive with the same TLT Session ID after the session is closed, they are saved in a new session.

Individual session timeouts can also be changed by triggered events. See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.

Canister Throttles

The Canister throttles can be used to change how long statistics and data records are retained in the canister for data collection and other purposes.

Setting Description

`Current Image Statistics Size`
Specifies the maximum number of records to be kept in the NIMG (Short Term Canister GUI display statistics) table. Setting this value to `0` disables this feature and allows unlimited growth. The default value is `10`.

`Alert records time to live`
Number of seconds that current image statistics are retained in the canister. The default value is `259200` seconds, which is 72 hours.

- If the Alert Service is disabled for a period longer than this setting, alert data may be lost. See “Configuring the Alert Service” on page 141.

`Fact aggregation records time to live`
Number of seconds that fact aggregation records are retained in the canister. The default value is `259200` seconds, which is 72 hours.

- If the Data Collector is disabled for a period longer than this setting, alert data may be lost. The Data Collector must be enabled and connected to each active canister. See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

`Dimension values records time to live`
Number of seconds that dimension values are retained in the canister. The default value is `259200` seconds, which is 72 hours.

- If the Data Collector is disabled for a period longer than this setting, dimension value data is lost. The Data Collector must be enabled and connected to each active canister. See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

`Path statistics records time to live`
Number of seconds that current image statistics are retained in the canister. The default value is `259200` seconds, which is 72 hours.

- If the Data Collector is disabled for a period longer than this setting, alert data may be lost. The Data Collector must be enabled and connected to each active canister. See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Event Bus

The Tealeaf Event Bus routes data from the in-memory database to the appropriate component for processing. For more information on configuring the Event Bus, see "Tealeaf Event Bus" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

Setting Description

`Enable Event Bus`
Enables the event bus pipeline for exporting events.

Note: After you enable or disable the Event Bus, please edit the `Pipeline Configuration File` value, even if you do not intend to make changes.

When **Apply** is then clicked, TMS validates the existence of the file and enables or removes the Event Bus configuration in the TMS WorldView. This issue is fixed in a later build.

Include Response
When exporting events, include the page's response file in the event packet.

Note: Including the response can significantly increase the volume of data sent to the Event Bus. Do not enable this option unless you are confident that the destination system can handle the increased volume.

Pipeline Configuration File
Path to the session agent pipeline used to export the events.

Note: The Event Bus should be configured through the Pipeline Editor in the Tealeaf Management System.

- See "Tealeaf Event Bus" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.
- See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

Canister Logging Tab

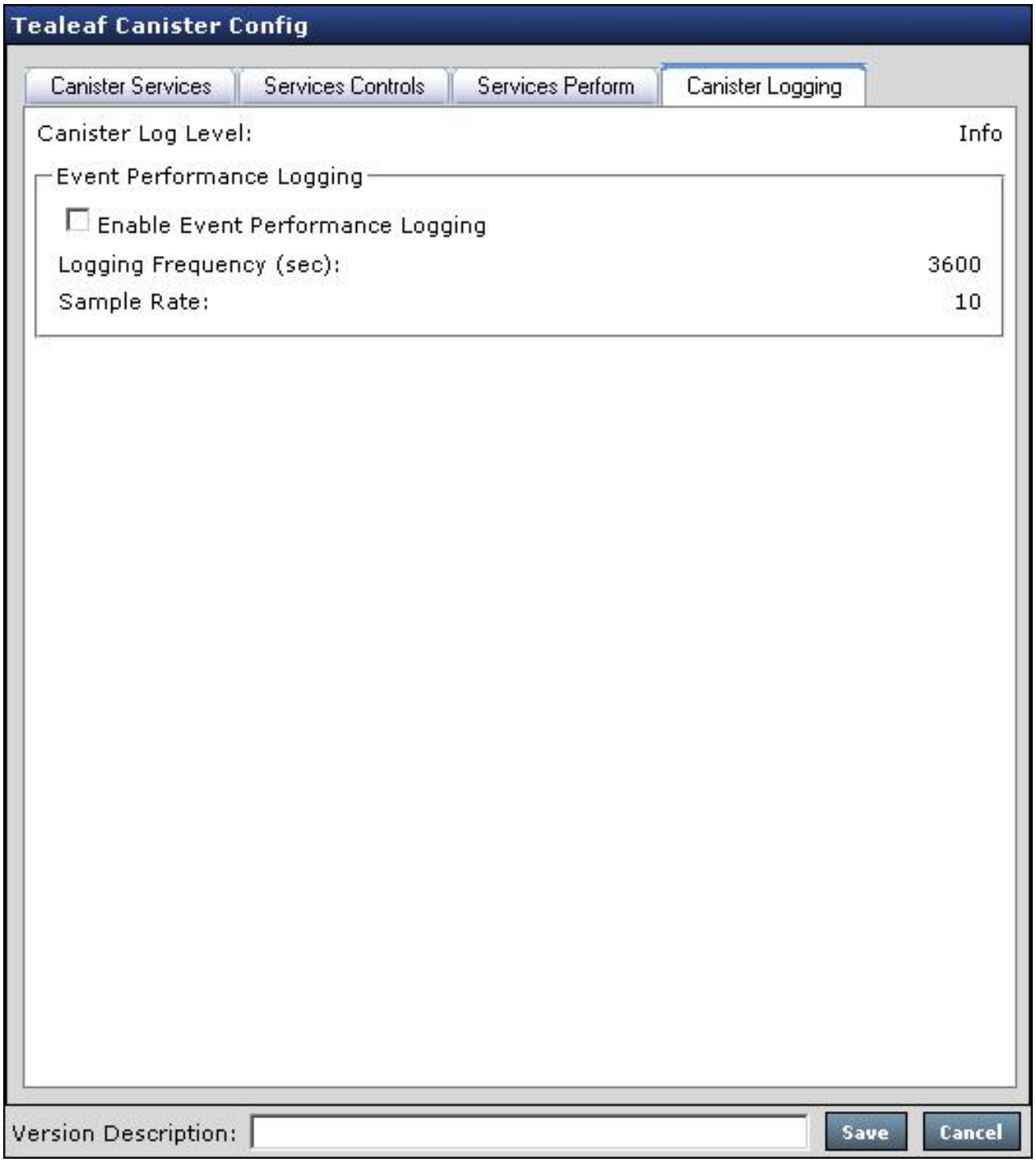


Figure 4. Canister Logging Tab

Setting Description

`Canister Log Level`

Set the log level for the canister:

- `Error` - Error level includes error messages.
- `Warning` - Warning level includes warnings and Error level messages.
- `Info` - Information level includes information messages and Warning and Error level messages. This setting is the default value.

- `Debug` - Debug level includes all debugging messages and all messages from the other three levels.

  Note: Debug level should be used only to debug specific issues, as the log files can grow quite larger. As soon as the issue is resolved, you should set the log level to one of the less verbose settings.

Event Performance Logging

The performance of event evaluation in the canister can be monitored through logging functions that you enable in this section.

Note: Since events may be firing at a high rate in the canister, you should test the frequency and sample rates to monitor the size of the generated logs.

Setting Description

`Enable Event Performance Logging`
Enables or disables event evaluation performance logging, which includes statistical information on the events that are firing.

`Logging Frequency (sec)`
Defines the interval at which event performance entries are inserted to the log. The default value is `3600` seconds (once per hour).

`Sample Rate`
The percentage of events which are sampled for event performance logging. The default value is one in ten events. Setting this value to 1 results in gathering performance data on every event evaluation.

Canister Statistics

By default, the Tealeaf Canister server monitors statistical information and periodically submits statistics hits for capture and storage in the Tealeaf database. These statistics can be reviewed through the Tealeaf System Statistics dashboard. See "System Statistics" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring the Canister Server

During installation, the Tealeaf Canister Server is configured and enabled automatically. While you can configure the Canister Server through TMS, you should not have to make any adjustments after the software is installed and configured properly.

Note: Unless you are experiencing problems connecting or interacting with your Short-Term or Long-Term Canisters, you should not need to make changes to the Canister Server configuration. For more information, please contact http://support.tealeaf.com.

To configure the Canister Server:

1. Login to the Tealeaf Portal as administrator.
2. To open TMS, select **Tealeaf** > **TMS**. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Expand the Canister Server node.
4. Click **Canister Server configuration**.
5. In the Config Actions pane, click **View/Edit**.
6. The Canister Server configuration is displayed. The following settings are available

Advanced Settings

Setting Description

DAT_MEMORY
Reserved memory for system data tables (bytes). The default value is 50MB.

DISK_FULL_LIMIT
When the available disk space drops below this value, it is considered full. Values are specified as a number of megabytes followed by MB. The default value is 100MB.

SIGNAL_READY
Full path to the TLTMaint utility.

Default Settings

Setting Description

CHECKPOINT_FLUSH
The default value is 17.

CHECKPOINT_INTERVAL
The frequency in terms of processed megabytes that a checkpoint update is performed. The default value is 10 MB.

COMMIT_DELAY
The delay in milliseconds between a commit command being initiated and executed. The default value is 2.

IDX_MEMORY
Reserved memory for canister indexes in bytes. The default value is 200000000 (approximately 200MB).

LOCAL_DIRECTORY
Full path to Canister directory.

Note: Changing the value of the LOCAL_DIRECTORY requires a rebuild of the canister. See "Troubleshooting - Canister" in the *IBM Tealeaf Troubleshooting Guide*.

LOG_SPACE
Space referred on the storage device for log data. The default value is 120 MB.

LOG_TEMPLATE
The ctree log template identifier. The default value is 2.

TRANSACTION_FLUSH
The default value is 500000.

After the changes have been saved, the Canister Server must be restarted for the changes to take effect. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Troubleshooting

For more information on troubleshooting, see "Troubleshooting - Canister" in the *IBM Tealeaf Troubleshooting Guide*.

Configuring CX Indexing

A session index is a database that stores the locations of meaningful words and fields in each session. Because an index does not contain all text from each session, it can hold a large quantity of session information in a single file.

- Noise words such as "but" and "if" are not indexed.
- After a session has been closed by the Short Term Canister, the IBM Tealeaf CX Server automatically indexes any sessions selected for archiving.
- Index files locate occurrences of data or error codes for which you can configure derived events, and conduct faster and more effective searches of captured data.

The underlying search engine supports many file types, including binary types such as `.pdf`, for indexing and search. When Tealeaf is configured to capture and process these file types, the search engine indexes the file for search, after which it can be searched through the Portal or RTV.

- Documents in some formats are converted by the search engine to HTML for display purposes. The original document is retained as part of the session record.

  Note: The search engine does not generally rely on the file extension to identify file types. However, you must configure the IBM Tealeaf CX Passive Capture Application to capture non-standard data types by using the filename extension. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
- See http://support.dtsearch.com/dts0103.htm.
- See http://support.dtsearch.com/webhelp/dtsearch/supported_file_types.htm.

Indexing Overview

The Session Indexer service converts Long Term Archive session to XML format.

1. It removes HTML tags and invalid XML characters.
2. Indexes are named by day, based on the time of the last hit.
3. The XML files are then converted to session index files and saved in the `Canister\Indexes` directory. The XML can then either be kept or deleted. To save disk space, Tealeaf recommends deleting this XML (the default setting).

The frequency with which the indexer service checks for sessions to index depends on the `Sleep Time` setting. See “Operation Times tab” on page 44.

After session index files are created, they can be used by both the Portal and IBM Tealeaf CX RealiTea Viewer to search sessions stored in the Long Term Canister.

- For more information on searching for sessions in the Portal, see "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.
- For more information on searching for sessions in RTV, see "RealiTea Viewer - Searching Sessions" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Index Processing

After a session is saved to the Long Term Canister, it gets indexed. During indexing, the session's hits, Canister events, and Canister summary information are written in XML format and sent to the indexing engine.

- Settings that control real-time processing of indexes are available through TMS. See “Configuration” on page 35.

Multiple Indexing Processes

The IBM Tealeaf CX indexing operation consists of a series of sub-programs that are single-threaded and executed in a time-based manner. You can modify the number of processes that run at the same time.
Index Program runs in the background and monitors captured session data for indexing. It executes the appropriate sub-programs to do the work at the appropriate times. These sub-programs are as follows:

1. `IndexCheck` - Checks to make sure indexes are synchronized with the library file and performs a verify operation that ensures indexes are in good condition.
2. `IndexMerge` - Merges multiple indexes.
3. `IndexMultiProcess` - Converts documents in multiple formats to indexes and saves them in the `<TeaLeaf_Install_Directory>\Canister\Indexes` directory.
4. `IndexDelete` - Deletes sessions from the index when requested by other Tealeaf components.

   Note: When Index Program is running, sub-processes such as `IndexMerge` or `IndexCheck` cannot be initiated from the command line. It is best to schedule execution of these sub-processes through TMS.

Index Program (`IndexProgram.exe`)

Index Program loops continuously, looking for indexing to be done until a stop is requested. If it finds indexing to be done, it checks for disk space and then starts the process.

Index Program retrieves a list of non-indexed sessions. Work files are then generated, each containing a list of non-indexed sessions to be indexed in a single batch.

- The number of work files generated is based on the Batch work file parameter and the number of available processes.

The following types of files are valid for indexing:

- `TLA` - Captured Tealeaf Archive files
- `TLC` - Canister Tealeaf Archive files
  - TLA and TLC files are not normally generated during the capture process, but the system can be configured to do so for troubleshooting purposes.
- `Filename.ano.yyy` - Annotation files
  - If the file is `filename.ano.xxx`, it is indexed using dtSearch's native indexing for files of type `xxx`. The work filename is `TeaLeafWork_nnn_mmm` or `WORKTeaLeafWork_1045006104_00000001`
    where:
    `nnn` is the UNIX time at the time of creation.
    `mmm` is a counter to ensure uniqueness.
- `DOC` - Microsoft Word files
- `PDF` - Portable Document Format (Adobe Reader) files
  - Annotation, PDF, and DOC files can be added as attachments to sessions through IBM Tealeaf CX RealiTea Viewer. For more information on adding comments and file attachments to indexes, see "RealiTea Viewer (RTV) User Manual" in the *IBM Tealeaf RealiTea Viewer User Manual*.
- `XML` - XML files

The number of files generated is based on the following formula:
`(Number of Index Processes) x (Batch work files)`

The maximum number of entries in each file is specified by the Workfile Batch setting. See “Indexing Options tab” on page 37.

You may specify additional HTTP response content types for indexing. See “Adding HTTP response content types for indexing” on page 47.

Configuration

UNC Paths Supported

You may enter UNC paths in any configuration field that requires a directory path.

IPv6 Supported

IP addresses are indexed for search in IPv4 or IPv6 format. Depending on your deployment, the IPv6 versions of the address are inserted into the request, from which they are indexed for availability in search.

- See "Support for IPv6" in the *IBM Tealeaf CX Installation Manual*.

Getting Started

Through Tealeaf Management System, you can configure indexing options.

Note: Changes to indexing configuration options are not activated until the Session Indexer service is restarted through TMS.

To view or edit indexing configuration settings:

1. Login to the Portal as an admin user.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. In the Servers view, select the desired server to drill down to components.
4. Select the **Session Indexer** component to display the configurations.
5. Select **Index Service configuration**.
6. In the Config Actions panel, click **View/Edit**.
7. The Indexing configuration tabs are displayed. For more information, see:
   - “Scheduling-Diagnostic tab” on page 36
   - “Indexing Options tab” on page 37
   - “Merge Options tab” on page 41
   - “Operation Times tab” on page 44

For more information on TMS in general, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Scheduling-Diagnostic tab

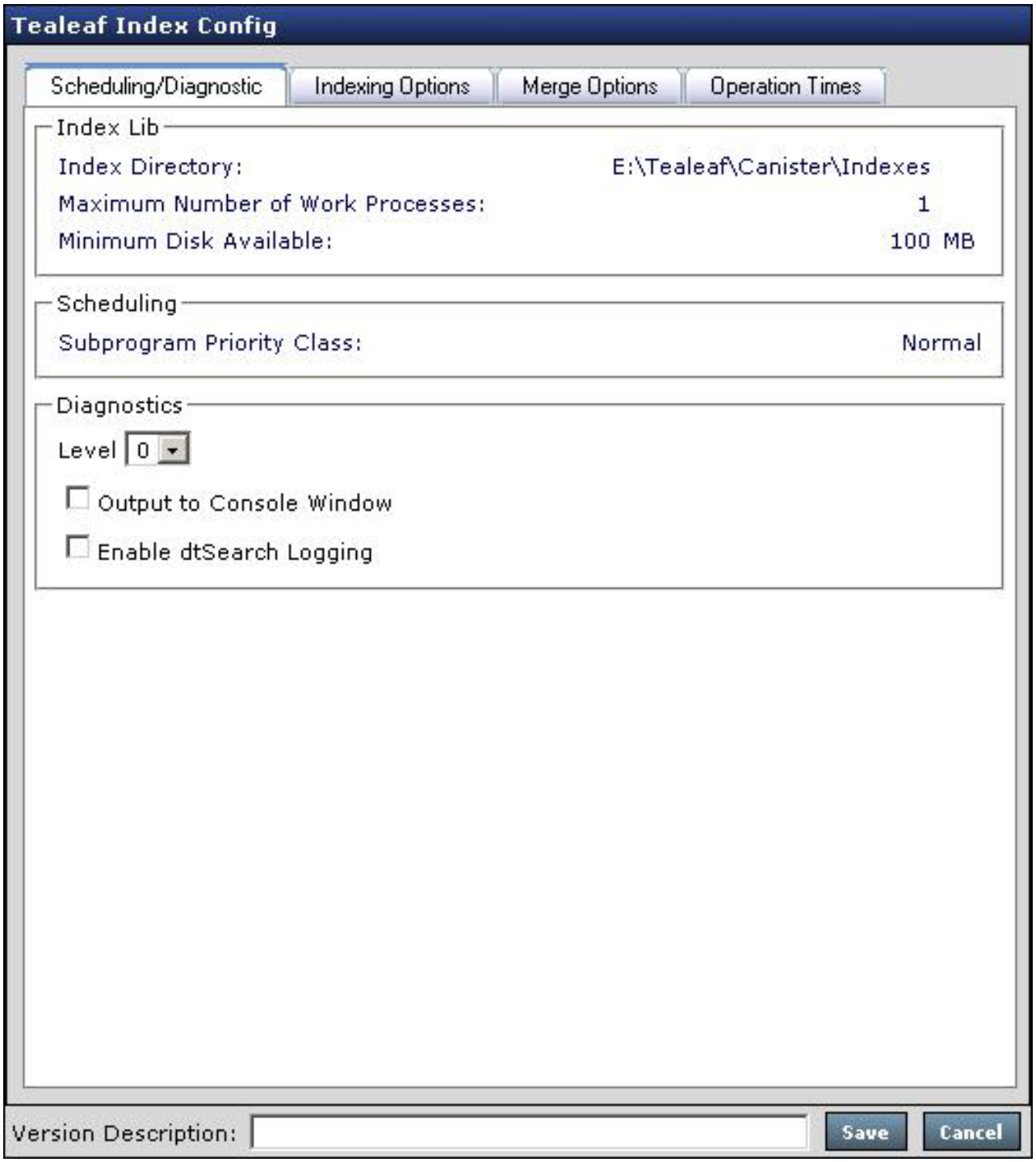


Figure 5. Scheduling-Diagnostic tab

Setting Description

`Index Directory`

Specifies the location of the index library (or control) file (`ixlib.tll`). This file contains the time at which the indexes were written and a list of all folders that comprise the index.

Maximum Number of Work Processes
This setting determines the maximum number of sub-processes used to complete the work. The default value is 1.

Note: A single index process should be configured at any given time. Additional index processes should only be configured if the session indexer consistently falls behind. Adding unnecessary session indexers may increase disk usage.

Minimum Disk Available
Specifies the minimum amount of space required for indexing to begin processing. The default is 100 MB.

- If you see Session Indexer NT event log messages reporting almost out of disk conditions because of a failure during write operations, increase this value by 25 percent and free up space on the disk containing the <Tealeaf_install_directory>\Canister\Indexes directory.

Scheduling
Indicates the scheduling priority of the sub-programs of session indexing. This value determines the priority class for the process.

Note: Do not change this setting unless directed by Tealeaf. For more information, please consult your Microsoft operating system documentation.

Level Specifies the amount of information to include in the log file:

- 5 specifies the greatest level of information.
- 1 specifies the least amount of information.
- 0 disables logging entirely.

Output to Console Window
When enabled, this option outputs log information to the console window when the Index Program is run from the command line.

Enable dtSearch Logging
When enabled, this option turns on dtSearch error logging.

Indexing Options tab

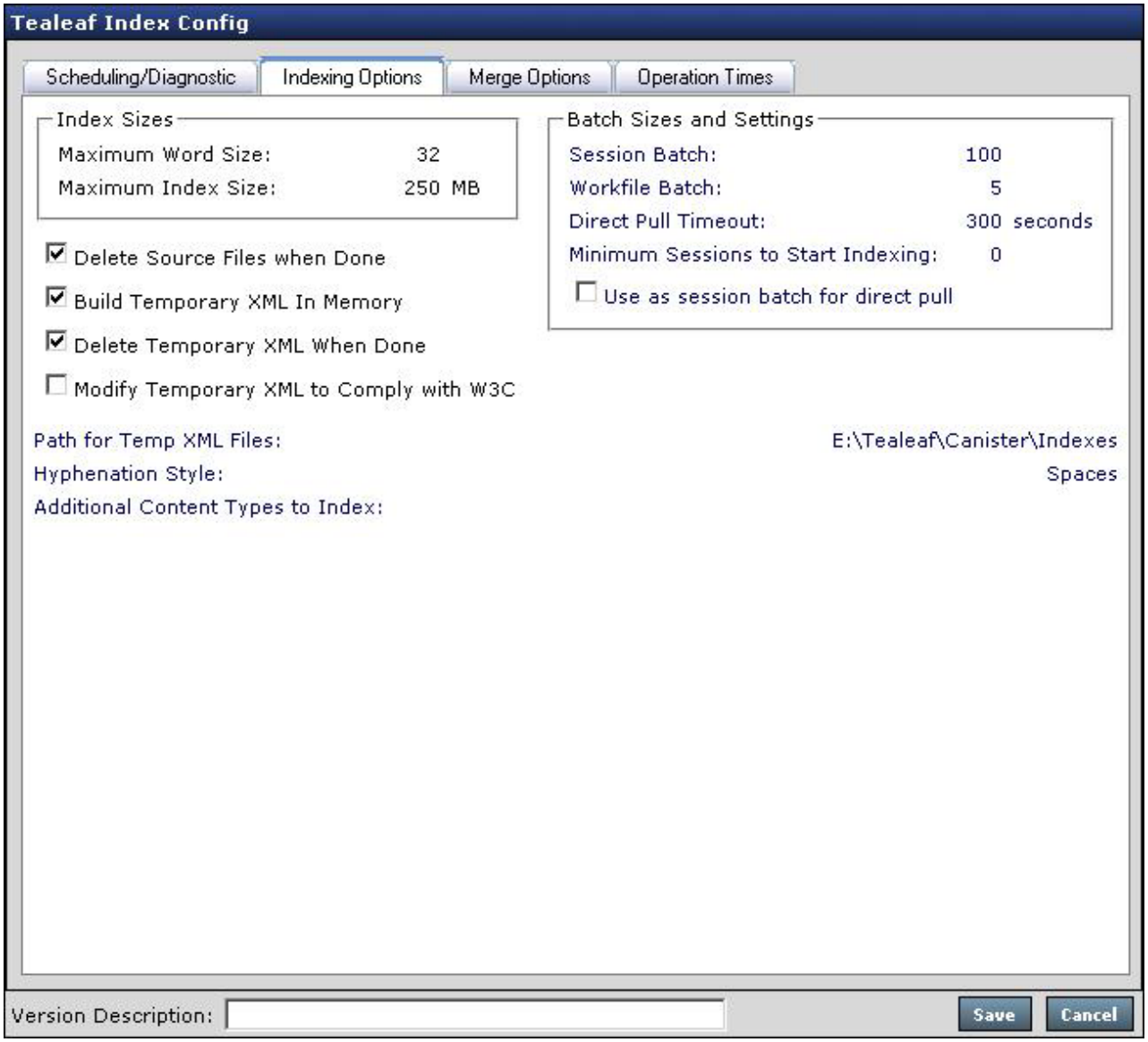


Figure 6. Indexing Options tab

Setting Description

`Maximum Word Size`

Maximum number of characters per word to index. For example, the default value is 32, which means that any characters in a word after the first 32 are ignored for indexing purposes.

Note: Changing this value can significantly alter the size of your indexes. Tealeaf recommends using the default setting. See "Configuring index sizes" on page 40.

`Maximum Index Size`

Specifies the maximum size an index can reach before a new index is created. The recommended value is `250` MB.

- The maximum value for this setting is `2048` MB.
- See "Configuring index sizes" on page 40.

Delete Source Files when Done
Automatically deletes TLA and TLC files from the `FilesToIndex` directory after they are processed. This setting is meaningful only when direct pull indexing mode is not being used.

Build Temporary XML in Memory
When selected, temporary XML is built in memory, instead of on disk. This default mode accelerates system performance.

Delete Temporary XML When Done
Automatically deletes temporary XML files when indexing is done. The default value is `true`.

- This setting should be selected when `Build Temporary XML in Memory` is enabled. It should be disabled only if the XML is required by another system, such as the BW Extractor.

Modify Temporary XML to Comply with W3C
This option fixes XML to comply with W3C specifications. When converted to XML, some HTML does not conform to the W3C specification.

- This setting directs the indexer to correct the XML to conform. This option increases the amount of work the indexer must perform and is necessary only when the temporary XML is used by another application.

Session Batch
The maximum number of sessions to index per run.

Workfile Batch
Specifies the number of work files to process at once. The default value is `5`.

Direct Pull Timeout
Closes the index if the current direct pull index batch has been indexing continuously for the specified amount of time. The default value is `300` seconds (5 minutes).

- This setting allows search processes to use the index periodically, rather than tie up the current index exclusively until some other threshold causes it to be closed.

Minimum Sessions to Start Indexing
Specifies the minimum number of sessions needed to start processing.

Use as session batch for direct pull
If selected, the `Session Batch` value is used for direct pull communication with the Canister.

Path for Temp XML File
Specifies the location where XML files are generated and stored as an intermediate step in the indexing processes, when not using in-memory indexing.

- This setting is used in conjunction with the `Delete Temp XML` setting. Temporary XML files are not deleted in cases where the XML is used as input to another system.

Hyphenation Style
Specifies how hyphens are treated for indexing purposes. See "Indexing hyphens" on page 41.

Additional Content Types to Index
Specify a set of one or more HTTP response content types whose data should be indexed. See "Adding HTTP response content types for indexing" on page 47.

Configuring index sizes: Through the Canister configuration, you can modify limits that affect the maximum permitted size of indexed words and indexed files.

Indexed word limits: By default, Tealeaf imposes a limit of 32 characters on the lengths of words to be indexed. Any word that is longer than 32 characters is length is truncated to 32 characters for purposes of indexing. For example, when the maximum word length is 32 characters, the words `ThisWordIsMyFavoriteWordOfAllTime` and `ThisWordIsMyFavoriteWordOfAllTimeNoItsNot` are both indexed as `ThisWordIsMyFavoriteWordOfAllTim`.

You can change the value of the `Maximum Word Size` setting to accommodate longer words if they are commonly in use on your web application. The maximum accepted word length is `128`.

Note: Changing this value can significantly alter the size of your indexes. Tealeaf recommends using the default setting.

Note: Changes to this setting apply only to indexes that are created after the change. Typically, those indexes are created the following day.

Note: The underlying search engine imposes a maximum limit of 80 characters on field names. When the maximum word length is greater than 80 characters, the underlying search engine limits field names to 80 characters. Field names that are longer than 80 characters are not included in the index at all. Using these words as search terms or field names will produce no results.

If you are searching for words longer than the maximum word size:

- You can use the wildcard (`*`) to search. See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.
- You can create a search field that applies an MD5 hash to the value. Users submit the full text version of the search term, which is converted to the 32-character MD5 hash value and submitted to the search engine for processing. See "Configuring Search Templates" in the *IBM Tealeaf cxImpact Administration Manual*.

Index file sizes: When the Indexer writes index files to storage, they are saved in separate directories for each day. When the size of the indexing files in a directory grows above the `Maximum Index Size`, a new directory is created, and new empty indexes are written to it. Subsequent indexing operations write to the new directory.

By default, the size of index directories is limited to `250` MB, which should enable the indexing of a day's session traffic for a medium-sized customer. This setting can be changed as needed. The maximum value for this setting is `2048` MB.

Note: The final size of the generated index directory may be larger than the value set for `Maximum Index Size`. If you must keep the size of the directory below this maximum size, set the value of `Maximum Index Size` to 30% less than the maximum desired size.

Indexing hyphens: Tealeaf's search engine indexes blocks of text yet provides mechanisms for how special characters are treated. Hyphens in session data can be treated in multiple ways. For example, the term `cross-reference` might appear in indexed data as:

```
crossreference
cross-reference
cross reference
```

Individual words within the hyphenated phrase are always indexed. In the above example, `cross` and `reference` are indexed in all methods.

You can configure the session indexer to index hyphenated text using any or all of the above methods. To specify the indexing style for hyphens, set `Indexing Hyphen Style` to one of the following values:

Value	Description
`Ignored`	Ignore hyphen (`crossreference`).
`Searchable Text`	Treat hyphens as searchable text (`cross-reference`).
`Spaces`	Treat hyphens as space (`cross reference`). This is the default value.
`All`	Index in all of the above styles. **Note:** Setting this value to `All` to index in all styles may bloat index sizes and produce unexpected results in searches involving longer phrases or words with multiple hyphens.

You should monitor changes in indexing rates after making this change.

Note: To apply this change to sessions that have already been indexed, you must re-index those sessions.

Merge Options tab

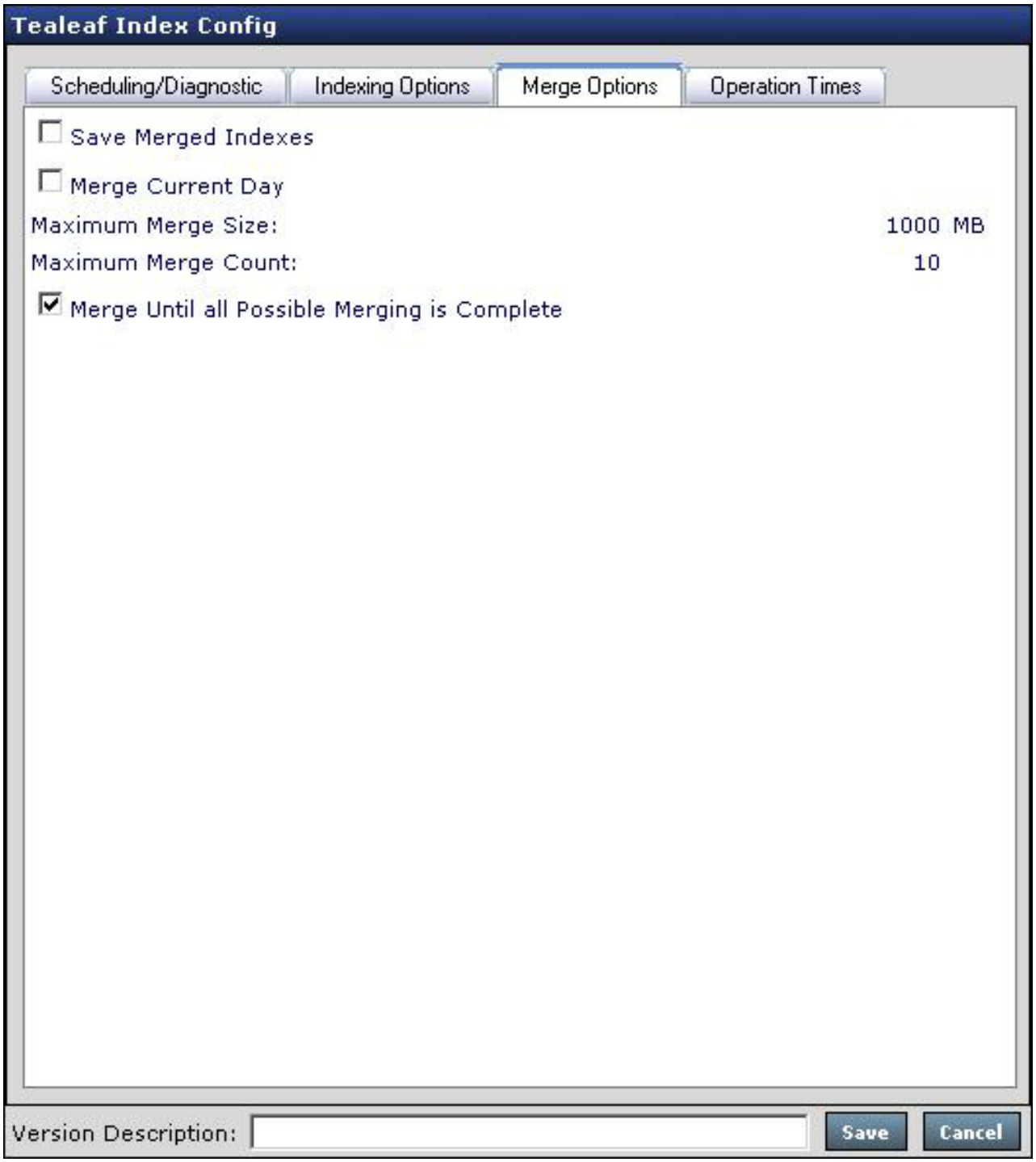


Figure 7. Merge Options tab

Setting Description

Save Merged Indexes
Saves merged indexes to the indexes directory. Does not delete the original indexes after they have been merged into a new merged index. This setting is useful only for troubleshooting purposes.

Merge Current Day
Merges the current day's indexes if they meet the criteria for being merged.

- If disabled, merging is attempted only on indexes from days previous to the current day.
- This setting is disabled by default so that merging does not compete with the process of creating new indexes for the current day's incoming data.

Maximum Merge Size
Specifies the maximum size (in MB) of a merged index.

Maximum Merge Count
Specifies the maximum number of indexes to merge into a new merged index.

Merge Until all Possible Merging is Complete
Repeats the merge process until every index that is below the `Maximum Merge Size` and `Maximum Merge Count` has been merged.

Operation Times tab

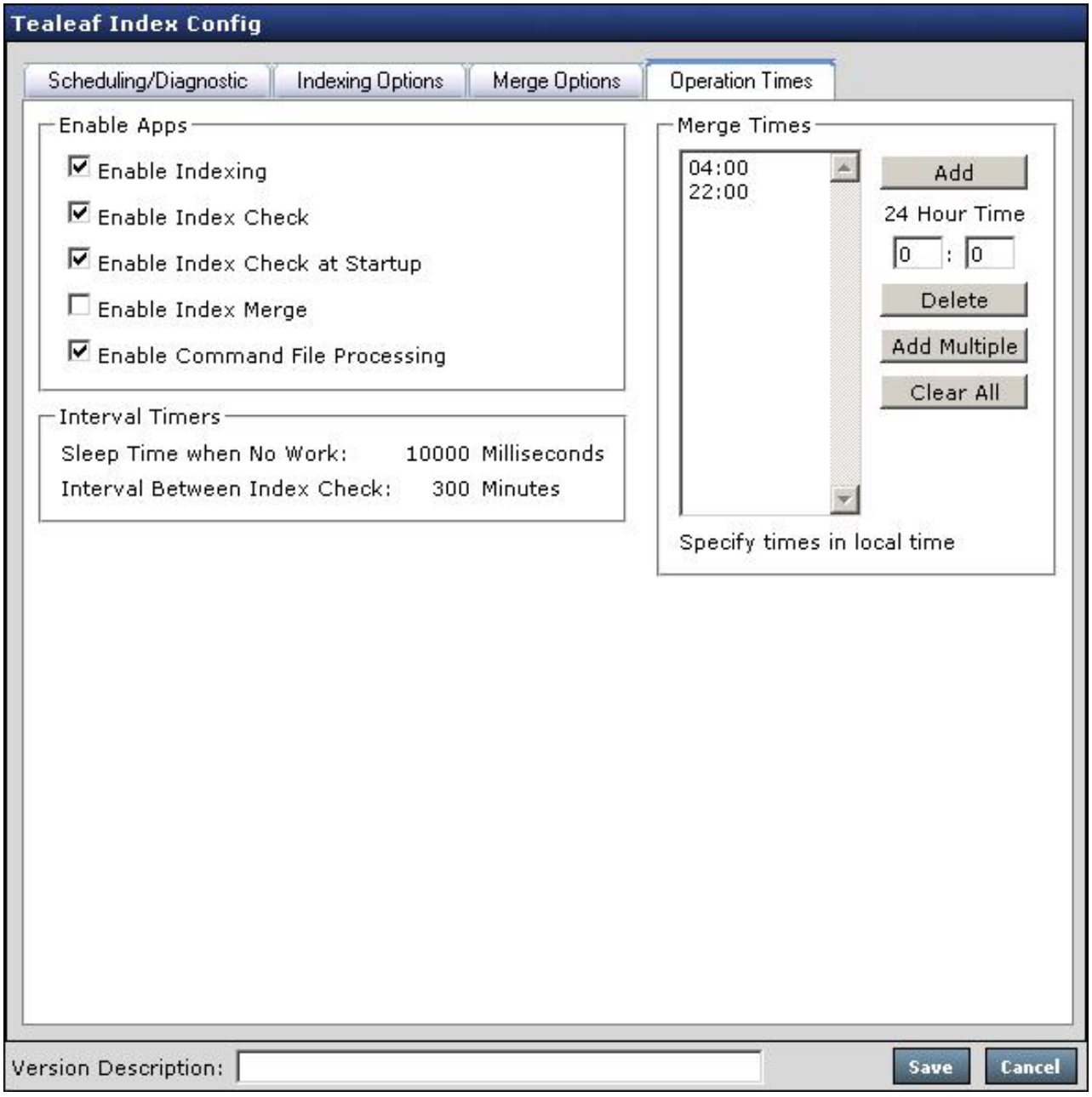


Figure 8. Operation Times tab

Setting Description

Enable Indexing
Master setting to enable or disable indexing of Tealeaf data.

Enable Index Check
Determines whether Index Check should run.

Enable Index Check at Startup
Determines whether IndexCheck should run at startup.

Enable Index Merge
Determines whether Index Merging should run.

Enable Command File Processing
Determines whether command files should run.

Sleep Time when No Work
Specifies the amount of time in seconds that indexing should sleep when there are no non-indexed sessions or XEQ files to process. The default value is `10000` milliseconds (10 seconds).

Interval Between Index Check
Specifies the amount of time in minutes to wait between runs of the Index Check process.

Merge Times
Specifies the time in 24-hour format to run IndexMerge to merge index files that meet the criteria specified on the Merge Options tab. You can add multiple merge times throughout the 24-hour day.

- Merge times are based off of the local time zone, instead of the Tealeaf system time zone.

Addition Settings

System group

In TMS, system group options for indexing in general are available under the Tealeaf component node. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Troubleshooting Session Indexes

See "Troubleshooting - Indexer" in the *IBM Tealeaf Troubleshooting Guide*.

Index Format and Storage

Indexes consist of an index library file (`IXILB.ILB`) and a corresponding group of index files (`*.IX`).

- The `ILB` file is used only if dtSearch Desktop is enabled. Index libraries are essentially lists that keep track of the names and locations of each index.
- `The IXLIB.TLL` file contains the same information as the library file, in addition to information used exclusively by IBM Tealeaf CX.

Format of Index Control File (`IXLIB.TLL`)

The following table provides a description of each tag that comprises the `IXLIB.TLL` file, a Tealeaf-specific file used by the IBM Tealeaf CX RealiTea Viewer for searching. It may be necessary to check this file for troubleshooting purposes.

Tag	Description
<Day>	A text version of the date
<Julian>	A pseudo-julian date: `(year - 2000) * 1000) + DayOfTheYear`
<FirstUse>	UNIX time of the last time of the first session in the index
<LastUse>	UNIX time of the last time of the last session in the index
<IndexName>	The name of the index

<IndexPath>
Relative path of the index

<Valid>
Is this index valid? False under certain situations, primarily merging, while indexes are being created.

<InUse>
Is the index in use?

<FirstSession>
Canister session identifier of the first session in the index

<LastSession>
Canister session identifier of the last session in the index

<CheckRequired>
Should a verification be run on this index? This option is set only when the `-F` flag is given to IndexCheck, or if something went wrong during normal operation.

<IndexSize>
dtSearch determination of the size of the index

<DocCount>
dtSearch internal value of the document count for this index

<CheckCount>
Is the `TLPIS.ix` file current for this index?

Index directories

An index directory is a sub-directory below the `TeaLeaf\Canister\Indexes` directory. Index directories are named with the time and date of index creation in the following format: `YYYYMMDDxxx`
where:
`xxx` is three sequential uppercase letters. For example, an index created on December 12, 2004 may be stored in a directory named `20041212AAA`.

An index file may represent several sessions, a single session, or a partial session depending on the limits specified for your indexing options. The number of created indexes depends on the individual index size limit specified in the Indexing Options dialog box. For example, if the individual index size is limited to 50 MB, a new index directory is created after the files in the current index directory reach this limit.

After an index is created, it is added to the library file and listed by directory name.

Indexed Content Types

The following content types, also called Internet media types and MIME types, are indexed by default:

Note: These configured content types apply to HTTP responses only. HTTP requests are indexed based on individual sections. See "Request File" on page 48.

- `text/html`
- `text/plain`
- `text/xml`
- `application/xhtml+xml`
- `application/rdf+xml`

- application/vnd.mozilla.xul+xml
- application/xml

Adding HTTP response content types for indexing:
As needed, additional content types can be added to the list of content types that are automatically indexed by Tealeaf.

Note: Depending on the content type, the IBM Tealeaf CX Passive Capture Application may need to be configured to capture it. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

The following are some of the notable types that may be added:
- text/json
- text/x-json
- application/json
- application/x-json

Note: Adding content types can cause the size of indexes to grow, depending on the volume of data of the added content type.

Note: Do not add binary content types for indexing. These types cannot be indexed, and attempting to index them adds no benefit and impacts indexing performance.

To add new content types, please complete the following instructions.
1. Login to the Portal as a Tealeaf administrator.
2. Select **Tealeaf** > **TMS**.
3. Click the Session Indexer node.
4. Select **Index Service configuration**.
5. Click **View/Edit**.
6. Click the Indexing Options tab.
7. Select **Additional Content Types to Index**.
8. Specify the new content types as a comma-separated list.

   Note: Do not include spaces.

   Note: No data validation is performed on the entries.
9. Click **Save**.
10. Configure a job to push the changes to all Tealeaf servers. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

Character indexing: Some rules by which the index performs indexing of specific characters can be applied through the alphabet.dat file. Additional special rules may be apply to specific data structures. See "Character Indexing" in the *IBM Tealeaf cxImpact Administration Manual*.

Indexed Items

STS File: The STS file contains data that applies to the entire session, including the session attributes.

[CanisterSummary] **Section**
The following variables in the Canister Summary section are indexed.

- TltStsBrowser
- TltStsCanisterID
- TltStsCloseSessionEvent
- TltStsDomain
- TltStsEnumValueId
- TltStsEventText
- TltStsEventUniqueId
- TltStsEventUniqueIdHour
- TltStsFirstPage
- TltStsFirstUse
- TltStsIPaddr
- TltStsLastUse
- TltStsLastPage
- TltStsLoginID
- TltStsNumHits
- TltStsRandomSel
- TltStsSesnDuration
- TltStsSesnID
- TltStsSesnIdx
- TltStsTLTVID
- TltStsTrafficType
- TltStsTxtPages
- TltStsUniqueIdAndEnumValueId
- TltStsUserDef
- TltStsUserID
- TltStsCustomVar0 - TltStsCustomVar63
- TltStsEventUniqueId fields are recorded in the STS file in the order of occurrence. An event is only listed once in the STS file but may be listed multiple times in the request buffers of individual hits.

For more information on these terms, see "RealiTea Viewer - Session Attributes" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Request File: [AppData] **Section**
Everything is indexed in this section.

If you wish to index something in the request, insert it as a name/value pair in this section.

[Env] **Section**
Only the following fields are indexed:

- http_referer
- http_remote_addr
- local_addr
- referer
- remote_addr
- remote_host
- StatusCode

- URL

This section may be populated from HTTP request/response headers, PCA data insertion, and Windows pipeline actions. See "RealiTea Viewer - Request View" in the *IBM Tealeaf RealiTea Viewer User Manual*.

[Timestamp]The following fields are indexed:

- NT_Grade
- RT_Grade
- WS_Grade

[URLField] **Section**
Everything is indexed in this section.

Session Attributes

In addition to searching the response data described above, Free Text searches look for and find any of these fields in a request.

cookies
Cookies are not automatically added to the indexes. Sites that employ cookies may have multiple cookies containing long unreadable strings of encoded data on personalization information, often unique to every hit. Indexing these generally leads to extremely large indexes.

If there is a specific cookie that should be indexed/searchable, you can add it to the [IndexFields] RTA rule that copies the cookie and its value into the [appdata] section of a request, which will make it be indexed and searchable.

Any Other Sections: Nothing else is indexed in the request files.

Response File: The HTTP header is not indexed in standard indexing.

REQ Section: For standard indexing, the following sections are indexed:

- [urlfield]
- [appdata]
- [TimeBlock] - time of the hit. See “TimeBlock section.”
- [TLFID_] section. See “Fact section” on page 50.

If there is an entry of TLMergeId in the [appdata] section, then put the <TLMergeId> entry at the end of the XML.

See "RealiTea Viewer - Request View" in the *IBM Tealeaf RealiTea Viewer User Manual*.

TimeBlock section: Into each request is automatically inserted the [TimeBlock] section, which contains timing information related to the hit. This data is automatically indexed.

Below is an example [TimeBlock] section:

```
[TimeBlock]
WEEK=24
MONTH=6
QUARTER=2
YEAR=2010
```

```
HOUR_OF_DAY=13
DAY_OF_WEEK=4
DAY_OF_MONTH=10
DAY_OF_YEAR=161
```

For more information on the definitions of each request variable, see "RealiTea Viewer - Request View" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Fact section: In standard indexing, each recorded fact is indexed, if it has been configured to be searchable through the Tealeaf Event Manager.

Note: Facts are flagged for indexing through the Tealeaf Event Manager. When the Searchable flag is set, the following name/value pair is inserted into the request:
`Searchable=True`
If the above value is `False`, the fact is not indexed.

If this flag is true, the following elements of the fact are indexed:

- `TLFID`
- `TLFactValue`
- `TLDimHash*`

Example fact definition:

```
[TLFID_78]
Searchable=True
TLFID=78
TLFactValue=1
TLDimHash1=926515C2EE3C2BAB9D2C675E0FD8B487
TLDimHash2=C815C31FCFF0FD2640B310579BD35BCC
TLDimHash3=8CD892B7B97EF9489AE4479D3F4EF0FC
TLDimHash4=04C3451BC46213B3EAD4DCBFBF9E3389
TLDim1=/store/defaultpage
TLDim2=www.straussandplesser.com
TLDim3=store
TLDim4=63.194.158.210
```

In the above example, under standard indexing, the first two items and the last form items are **not** indexed.

For more information on enabling the indexing of specific facts, see "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.

RSP Section: HTTP headers are removed for Standard Indexing.

See "RealiTea Viewer - Response View" in the *IBM Tealeaf RealiTea Viewer User Manual*.

TimeGrades: The following TimeGrades fields are in the XML for every hit:

- `<WS_Grade> ExcellentWS </WS_Grade>`
- `<NT_Grade> ExcellentNT </NT_Grade>`
- `<RT_Grade> ExcellentRT </RT_Grade>`

  Note: Other options besides ExcellentWS, etc. are `Normal<nn>`, `HighNormal<nn>`, or `High<nn>`, where `<nn>` represents WS, NT, or RT, depending on the measure.

In captured data, you can search for time grades.

- See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.
- For more information on configuring time grades, see "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

JSON Messages: Messages submitted in JSON format from the Tealeaf client frameworks are automatically indexed as Request/RequestBody pairs.

Note: The Tealeaf client frameworks enable the capture of client-side user interface events from web, mobile web, iOS, and Android applications.

For more information:

- See "UI Capture j2 Guide" in the *IBM Tealeaf UI Capture for j2 Guide*.
- See "Tealeaf Android Logging Framework Reference Guide" in the *IBM Tealeaf Android Logging Framework Reference Guide*.
- See "Tealeaf iOS Logging Framework Reference Guide" in the *IBM Tealeaf iOS Logging Framework Reference Guide*.

For more information on JSON message indexing, see "Integrating Client Framework Data into Tealeaf" in the *IBM Tealeaf Client Framework Data Integration Guide*.

Monitoring Indexing

You can use the following mechanisms to monitor indexing.

System Status - Canister report

Through the Portal, you can monitor the status of canisters. In the Portal menu, select **Tealeaf** > **System Status** > **Canister**. From the IBM Tealeaf CX drop-down, select the specific Canister you wish to monitor. Click **Refresh** if necessary. See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

System Status - Storage report

Through the Portal, you can monitor the indexing of sessions over the number of days that sessions are retained in each server. In the Portal menu, select **Tealeaf** > **System Status** > **Storage**. The base report provides overall storage requirements for each Canister or archive.

From the Storage Server drop-down, select the specific Processing Server you wish to monitor. Click **Refresh** if necessary. In the displayed report, you can compare the values in the `LSSN Sessions` column to the value in the `Index Sessions` column for each day to determine if indexing is falling behind.

See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

Tealeaf Status report

The Tealeaf Status report contains a wealth of information on IBM Tealeaf CX system health and status. Specific to indexing, you can search a generated Tealeaf Status report for the "Canister Overview" section and "Canister Status" section for individual servers.

If the Session Indexer falls behind a threshold set for the number of un-indexed sessions, the Tealeaf Status report includes the following message:

```
Sessions Waiting to be Indexed has broken its threshold.
```

To generate an immediate Tealeaf Status report through the Portal:

1. Login to the Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **Portal Management**.
3. In the Portal Management page, click the Logs pane in the left-navigation panel.
4. Click the View Tealeaf Status link.
5. A Tealeaf Status report is generated and displayed.
   - See "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*.

Indexing Logs

In the `Logs` directory inside the Tealeaf install directory, the following log files contain useful information about indexing services:

File **Description**

`history.ix`
Main session indexer log.

`TLTIndexMultiProcess*.log`
Log messages generated by the spawning process for indexing.

`TLTIndexCheck*.log`
Log messages generated by the `IndexCheck` sub-program.

`TLTIndexMerge*.log`
Log messages generated by the `IndexMerge` sub-program.

`TLTIndexService*.log`
Log messages for the Tealeaf Indexing Service.

- In the above filenames, the `*` value is a date stamp and the process identifier.

Adding Other Fields for Indexing and Search

By default, Tealeaf indexes various request data so that Tealeaf components and users can search for sessions using a range of criteria. The set of available fields is defined for the most common case. Any application-specific fields or data added using optional Tealeaf components is not automatically available for search.

The following section provides a set of potential methods for making any request variable available for indexing and searching. By default, most Tealeaf solutions do not index response data.

Methods and Tradeoffs

General approach: To make data available for indexing, it must be located in or moved to a section of the request where data is indexed.

Note: The IndexMultiProcess does not support specifying individual fields or sections of the request for indexing. All additional data that is to be indexed must be inserted into the `[appdata]` section of the request.

The purpose of indexing, however, is to make the data available for search. It is possible to also make request or response data available for search by creating events that capture and store the values as event data.

In the sections below, the different approaches are described, and examples are provided for making the data available for each approach.

Methods for making indexing available for search: Use the following methods to make request or response data available for indexing. You can also use these methods to move response data.

Table 1. Methods for making indexing available for search

Method	Description	Pros	Cons
Move request data to `[appdata]`	Using the Privacy session agent, you can move any request variable into the `[appdata]` section of the request. All fields in this section are automatically indexed. See "Using Privacy to Insert Request or Response Data for Indexing" on page 54.	• Privacy session agent should already be deployed. • Indexed data is available in a consistent space	• Data is not available for reporting. • Indexes are stored in individual Canisters and are periodically trimmed when the session is no longer available. Reporting data is typically retained for a longer period of time in a SQL database. • Privacy session agent can be resource-intensive, particularly if regular expressions are used or if the field occurs frequently in session data. • A limited number of rules can be created for Privacy session agent. • With two copies of the data in the request, it is possible for discrepancies to be created between the request variable names and their values. • Each additional field added to indexing grows the size of the indexes

Table 1. Methods for making indexing available for search (continued)

Method	Description	Pros	Cons
Create an event to capture the request data	Through the Event Manager, you can create an event to capture and store the request data. From the Portal, you can then search for sessions using the event or values for the event. See "Creating Events to Enable Searching for Session Data" on page 56.	• Event data is available for search and for reporting. • Event data is stored in the session itself; indexing data is stored separately. • By default, event data is stored in the SQL database for 365 days. • Event data is more widely accessible in the Portal. For example, you can locate sessions that contain events based on the icon associated with the event.	• Events can be configured to be checked on every hit when they only need to be checked on the first or last hit, for example, which impacts Canister performance. • If regular expression is used to define an event, event evaluation can be impacted by a poorly constructed regular expression. • Adding a new event increases the storage required for every session in which the event occurs. Depending on how frequently the event is triggered and the number of dimensions associated with the event, the storage increase can be significant. • Events are also stored in the Reporting database and, if IBM Tealeaf cxResults is licensed, the Visitors database.

Using Privacy to Insert Request or Response Data for Indexing

The Privacy session agent can be used to move request or response variables and values into the `[appdata]` section of the request, where it is automatically made available for indexing.

Note: Adding new fields for indexing increases the size of the indexes, particularly if the fields occur frequently in the session data. Additionally, depending on privacy rules are created, the new processing can impede throughput in the Windows pipeline. Tealeaf recommends creating a single Privacy rule to move one field of data and checking the change in the size of the indexes before adding more rules.

Note: Adding new fields for indexing is not required to enable users to search for the data. To search for request variable and value combinations, users may enter the following in the All Text field:

```
RequestVariable contains RequestVariableValue
```

where

- `RequestVariable` = the name of the request variable
- `RequestVariableValue` = the value of the request variable

While the above method works, it is expensive in terms of Search Server processing. Tealeaf recommends moving the data for indexing for searching for common request variables.

Example: The Tealeaf IBM Tealeaf CX UI Capture for AJAX solution captures items that may not generate transactions with the web server, such as user interface events and other properties, from the visitor's browser and submits them to Tealeaf for capture. Using Tealeaf IBM Tealeaf CX UI Capture for AJAX, you can capture a rich repository of data about visitors to your web application.
For more information on IBM Tealeaf CX UI Capture for AJAX, see "UI Capture FAQ" in the *IBM Tealeaf UI Capture for AJAX FAQ*.

When IBM Tealeaf CX UI Capture for AJAX is deployed, some Tealeaf performance reports are populated with data captured from the visitor's browser. These reports are available through the Tealeaf Portal. For more information on performance reporting, see "Analyzing Performance" in the *IBM Tealeaf Reporting Guide*.

However, these reports are generated from internal events in the Canister. For maintaining performance, the Canister does not maintain events to reflect all of the possible data captured from the client. For example, exceptions detected in the user interface are detected by IBM Tealeaf CX UI Capture for AJAX and submitted to Tealeaf, but they are not available in the provided reports.

This information could be very valuable for assisting customers with problems with your web application and then providing that information to developers to resolve. If you were able to capture this information and store it in such a way that it is indexed for search, CSRs at your enterprise could search for these sessions, drill into them to locate the customer issues, and then provide the sessions to developers for further resolution.

Tealeaf automatically provides this information in the `[env]` section of the request. In that section, IBM Tealeaf CX UI Capture for AJAX inserts the following request variable containing an identifier for the number of client user interface exceptions:

```
HTTP_X_TEALEAF_PAGE_CUI_EXCEPTIONS=2
```

See "UI Capture for AJAX Sample Client Event Message" in the *IBM Tealeaf UI Capture for AJAX Guide*.

Configuring privacy: By default, Tealeaf does not index this field, so you can use the Privacy session agent to move this field into the `[appdata]` section of the request.

Note: The following example is created using the raw configuration for the privacy filter. If you are creating multiple rules to move content to the `[appdata]` section of the request, you can copy and paste finished versions of the rule to create new, similar rules.

- If you prefer to use the TMS interface to create privacy rules, you can review a similar example for configuring IBM Tealeaf cxResults visitorization. See "cxResults Installation" in the *IBM Tealeaf cxResults Administration Manual*.

See “Privacy Session Agent” on page 291.

See “Extended Privacy Session Agent” on page 261.

To configure privacy indexing:

1. Verify that Privacy is enabled.
2. Open the privacy configuration.
3. Create a privacy action and rule.
4. Test the privacy action and rule.
5. Create any additional rules and actions.

Creating Events to Enable Searching for Session Data

The other method of making additional request data available is to capture the values for the request variable into event objects.

- When request data is captured in events, you can search for the data through the Portal. See "Events" in the *IBM Tealeaf cxImpact User Manual*.
- Additionally, the data is available for reports created through the Report Builder. See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

In the steps below is presented a general approach for how to capture request data into event objects for search and reporting purposes.

1. **Identify the request data to capture:**
   - In our example above, we are searching for data that fits the following pattern:
     `HTTP_X_TEALEAF_PAGE_CUI_EXCEPTIONS=2`
   - The value to the right of the equals sign is the one to capture and can change with each hit.
2. **Create the hit attribute:** Through the Event Manager, you must create the hit attribute to look for and capture, if present, this data on each hit. Key properties:
   - Define the hit attribute to check the request.
   - **Start Tag:**
     `\r\nHTTP_X_TEALEAF_PAGE_CUI_EXCEPTIONS=`
   - **End Tag:**
     `\r\n`
   - Verify that it is not a case-sensitive search.
   - See "TEM Hit Attributes Tab" in the *IBM Tealeaf Event Manager Manual*.
3. **Create the dimension:** You can also create a dimension sourced from the hit attribute to capture the contextual information. Key properties:
   a. Populated By: Select the hit attribute that you created.
   b. Populate With: Select the `First Value on Page/Hit`.
   c. Values to Record: Select `Whitelist + Observed Values`.

      Note: When observed values are allowed to be recorded, data is immediately collected and available. However, every instance of the dimension is recorded without limit to the number of instances. Wherever possible, dimensions that record observed values should be converted to whitelist only dimensions.
      - See "Data Management for Dimensions" in the *IBM Tealeaf Event Manager Manual*.
      - See "Whitelists and Blacklists" in the *IBM Tealeaf Event Manager Manual*.
4. Save the dimension.
5. Commit the changes to the server.

6. **Create the event:** Through the Event Manager, you can create the event to be triggered off of the hit attribute. The event records the value of the hit attribute. Key properties:
   - Evaluate: `Every Hit`
   - Track: `Every Occurrence`
   - Value Type: `Numeric`
   - Condition step:
     - Select the hit attribute you just created. If you did not specify a label for it, it is under the `Default` label.
     - Set the condition to be `Hit Attribute Found` and `Is true`, since this value is not inserted when there are not exceptions.
   - Value step:
     - For the item to record, select the hit attribute you created, which means that the numeric value of the hit attribute is recorded as the numeric value for the event.
   - Report Groups step:
     - If you wish to have the event associated with any contextual information, you can associate report groups containing the contextual dimensions in this step. It is not a required step.
   - More Options step:
     - Until you are satisfied with the results of the event, you may not want to include in IBM Tealeaf cxResults (if licensed) or send to other components or event objects.

   a. Save the event and hit attribute.
   b. Commit the changes to the server.
      - See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.
7. **Test the event:** To test the event, you can send sample sessions, which include the data, to the Event Tester. See "Event Tester" in the *IBM Tealeaf Event Manager Manual*.
8. **Allow event counts to accumulate:** If the event and hit attribute are properly firing in the Event Tester, you must let sufficient time to pass for occurrences of the event to be detected in the Canister and stored in the reporting data.
   a. While you are waiting, you can search for the event through the Portal.
      - You should be able to search for active sessions that include the event as soon as it is detected in the Canister.
      - See "Events" in the *IBM Tealeaf cxImpact User Manual*.
   b. After sufficient time has passed, you can create a report using the event.
      - If you created the dimension, you can use it in reports, too.
      - See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

For more information on using the Event Manager, see "Tealeaf Event Manager" in the *IBM Tealeaf Event Manager Manual*.

Troubleshooting

For more information on troubleshooting, see "Troubleshooting - Indexer" in the *IBM Tealeaf Troubleshooting Guide*.

Configuring the Report Server

The Report Server consists of the Portal Web Application, the databases, and the Data Service. To configure the report server, you can use Tealeaf Management System (TMS).

- For more information on TMS in general, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Report Server Time Zone

The time zone for the Windows machine hosting the Tealeaf Report Server must be configured to match the Tealeaf system time zone. This requirement may be loosened in a subsequent release.

- See “Configuring the System Timezone” on page 12.

Accessing the Report Server Configuration

Note: Changes to the Report Server configuration require an IISReset, which forces all users from the Tealeaf Portal. Please perform these configuration changes accordingly.

To view or edit Report Server configuration settings:

1. Log in to the Portal as an admin user.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. In the Servers view, select the desired server to drill down to components.
4. Select the **Tealeaf** component to display the configurations.
5. Select **Shared configuration information** to display the Config Info dialog.
6. Click **View/Edit**. The Configuration Editor is displayed.

   Note: After you make changes to the Report Server configuration, the following steps are required:

   a. Push the configuration to all servers through TMS.
   b. Restart the Tealeaf Data Service. See "Configuring the Tealeaf Data Service" in the *IBM Tealeaf CX Configuration Manual*.
   c. Perform an IISreset of the Tealeaf Portal.

Portal tab

The following information is accessible via the Portal tab.

Figure 9. Portal tab

Setting Description

`Portal Session Timeout`
Specifies the amount of time in minutes a Portal user can remain inactive before automatically logging off.

`Date Format`
Controls the input/output format for the dates in the Portal.

Authentication Method

Select one of the following values: 3DES (default), RC2, MD5, or NT.

- 3DES authentication is the default method for all new installs of IBM Tealeaf cxImpact.
- NT Authentication enables the Portal to use a Windows digest-style authentication model for user logins. See “Portal NT Authentication” on page 65.

Search Server Timeout

Specifies the timeout setting for Search Server. Default value is 300 seconds (5 minutes).

Allow Mixed Mode Login

Mixed Mode Login allows Portal users to choose whether to authenticate via the Tealeaf database or via the Windows NT domain method. When Authentication Method is set to NT, this setting toggles display of the "Login using database authentication" link on the login page in the Portal. To remove the link, enable this option.

Database tab

The following information is required when connecting to the database, which is automatically configured during installation of Tealeaf.

Note: These values should not be altered unless you make specific changes to the database connection parameters (host name with an instance and port number).

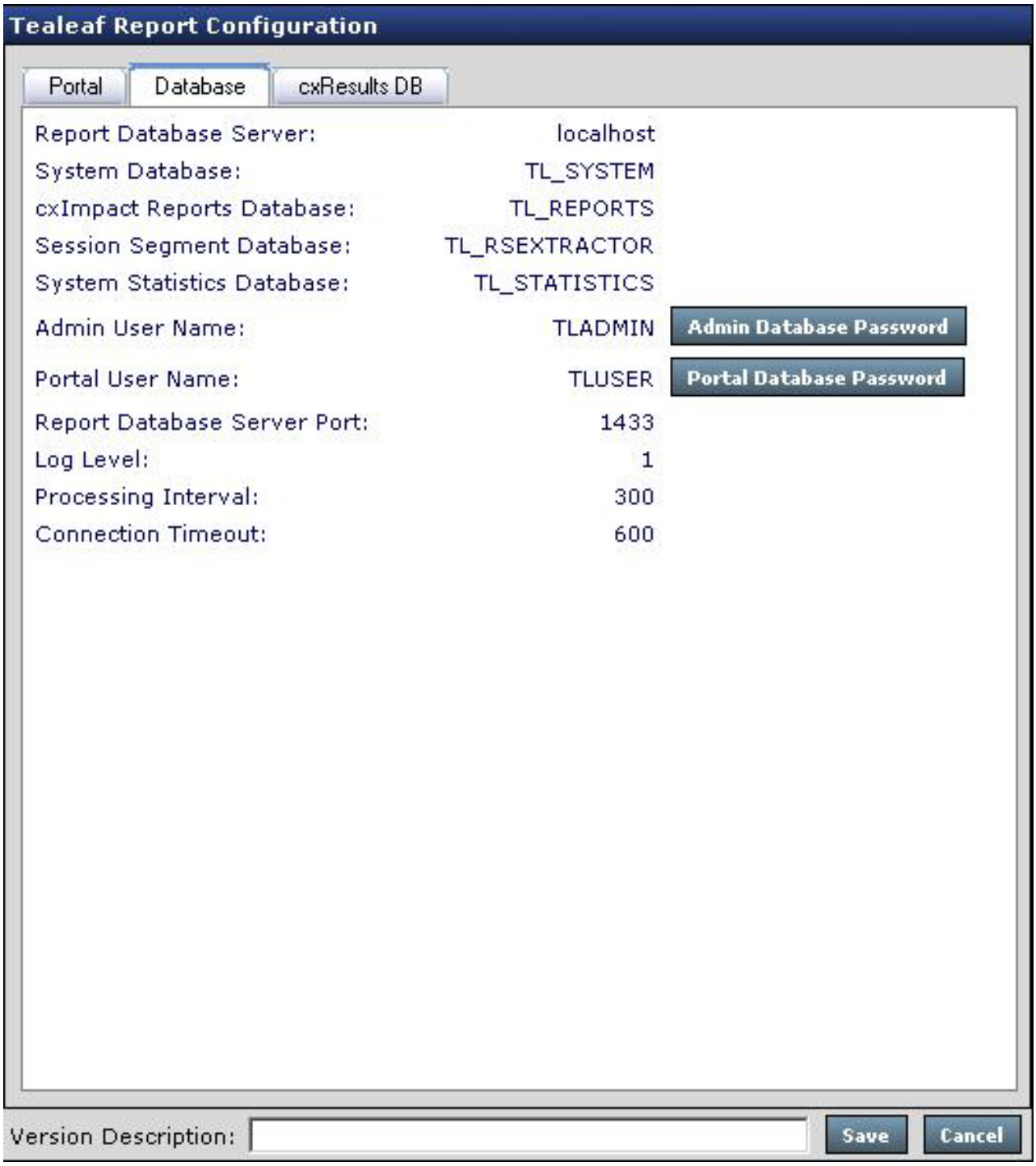


Figure 10. Database tab

Setting Description

`Report Database Server`
Defines the name of the database host. If the databases are on a named instance, the following format should be used: `<server name>\<instance name>`.

`System Database`
Defines the name of the Report Database. Default value is `TL_SYSTEM`.

cxImpact Reports Database
Defines the name of the Report Database. Default value is TL_REPORTS.

Session Segment Database
Defines the name of the Result Set Extractor Database. Default value is TL_RSEXTRACTOR.

System Statistics Database
Defines the name of the System Statistics Database. Default value is TL_STATISTICS.

Admin User Name
Defines name of user for databases with alter privileges. Default value is TLADMIN. See "Changing Database Passwords."

Portal User Name
Defines name of user for database with read/write privileges. Default value is TLUSER. See "Changing Database Passwords."

Report Database Server Port
Specifies the port used to communicate with the SQL Server database. Default value is 1433.

Note: If you are using a port other than the default (1433), that port number must be inserted when you connect to the Tealeaf databases using the Tealeaf Database Manager. See "Tealeaf Database Manager Reference" in the *IBM Tealeaf Databases Guide*.

Log Level
Determines the logging level from 1 (lowest) to 9 (highest).

Note: Log Level is also used by the Portal to determine the level of logging to display in an error. Level 9 displays all details in the Portal and should only be used for debugging purposes.

Processing Interval
Determines the idle period between data collection runs. If this number is set to 0, the Data Service runs once and stops. The default is 300 seconds or (5 minutes), which is the lowest recommended setting.

Connection Timeout
Determines the maximum time in seconds for the MSSQL server to respond. The default value is 300 seconds (5 minutes).

Changing Database Passwords

Note: Changing database passwords in the Portal changes only the passwords used by the Portal to connect to the database; it does not change the passwords in SQL Server. Please change passwords using the following steps.

1. Login to the Report Server.
2. Stop all services except for the Tealeaf Management System, which is required to complete this set of steps.
3. In SQL Server, change the passwords for the Tealeaf administrator and user accounts.
   - By default, these account IDs are TLADMIN and TLUSER.
   - Retain the passwords for later use.
   - For more information on making this change in SQL Server, please see the documentation that came with the product.

4. Run the Tealeaf Database Manager. Connect using an account with database administrator permissions.
5. In the Tealeaf Database Manager menu, select **Info/Config** > **Report Server Configuration**.
6. Change the passwords as desired.
7. Click **OK**. Passwords are changed.
8. To exit the Tealeaf Database Manager, click **Exit**.
9. Relaunch the Tealeaf Database Mananger. Connect using Tealeaf authentication.
10. If the passwords that you entered are correct, then you should be able to login to the Tealeaf Database Manager.
11. Click **Exit**.
12. Restart all Tealeaf services on the Report Server.

cxResults DB tab

In the IBM Tealeaf cxResults tab, you can configure the names of the server and databases in use for IBM Tealeaf cxResults.

Note: This tab does not appear if you have not licensed and installed IBM Tealeaf cxResults. IBM Tealeaf cxResults is a separately licensable product of the IBM Tealeaf CX platform. IBM Tealeaf cxResults is no longer available as a newly licensed product as of Release 8.7. Customers that licensed IBM Tealeaf cxResults in Release 8.6 and earlier may continue to use and receive support for the product in Release 8.7 and later. For more information, please contact Tealeaf Customer Support .

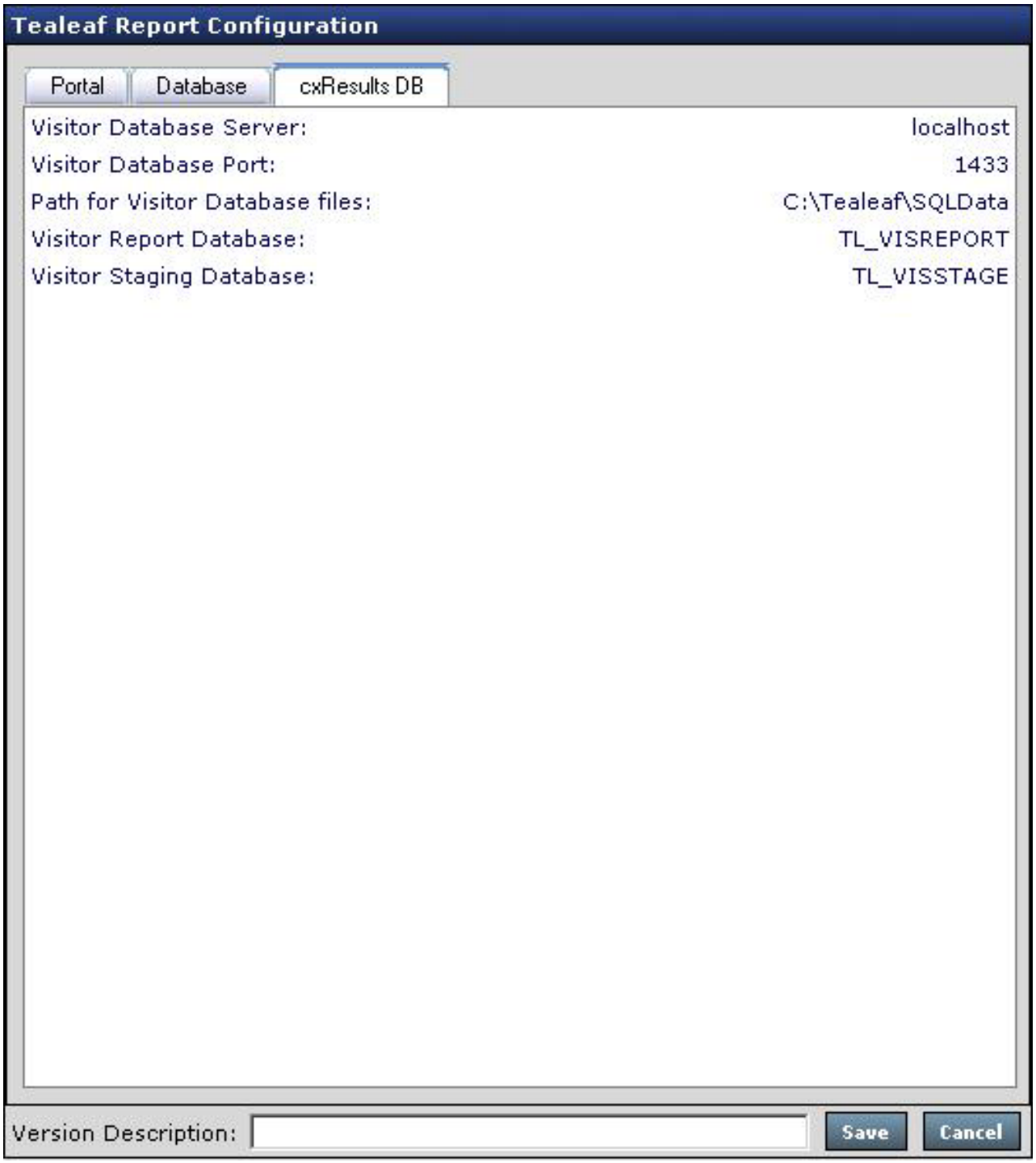


Figure 11. IBM Tealeaf cxResults DB tab

Setting Description

`Visitor Database Server`
Defines the name of the database host for the Visitor report and staging databases. If the databases are on a named instance, the following format should be used: `<server name>\<instance name>`.

`Visitor Database Port`
The port used to communicate with the visitor databases.

Path for Visitor Database files
On the hosting server, the full path to where the visitor database files are stored.

Visitor Report Database
The name of the Visitor report database.

Visitor Staging Database
The name of the Visitor staging database.

Additional Report Server Configuration

You can perform the additional configuration tasks for the Report Server outside of TMS.

Configuring SNMP Traps

See “Configuring the Alert Service” on page 141.

Portal NT Authentication

Portal NT authentication mode enables the Portal to authenticate users based on their Windows NT domain identities. To use this feature, Portal user accounts must be configured to be associated with NT domains and usernames. When a user is logged on to an NT domain associated with a Portal user identity and requests the Portal login page, that user is recognized as an NT domain user and can log in to the Portal using NT domain credentials. The Portal user account associated with their NT credentials then determines what Portal features and data (e.g., charts) can be accessed by the user. For more information on Tealeaf authentication methods, see "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

Troubleshooting

For more information on troubleshooting, see "Troubleshooting - Reporting" in the *IBM Tealeaf Troubleshooting Guide*.

Configuring the Tealeaf Data Service

The Tealeaf Data Service manages connections between Tealeaf components and services and the databases they are querying. This service allows database connectivity to be managed as a Windows-based service for security, reliability, and control.

- As of Release 8.0, the Reporting Service is an integrated component of the Tealeaf Data Service.

To acquire data, Tealeaf servers and services send queries through the Tealeaf Data Service, which then issues queries to the appropriate databases, canisters, or both.

- Search Server does not communicate directly with the database.
- Any non-Portal Server issuing a command that requires the Tealeaf Data Service is redirected to the Search Server associated with the Portal Server. This instance of Search Server queries the Tealeaf Data Service and returns the data.

Connections

The Tealeaf Data Service replaces some of the functionality managed by the Search Server, which utilizes SQL authentication for direct access to the Tealeaf databases. In some environments, this authentication method is problematic.

Currently, the Tealeaf Data Service manages the following connections:

1. **Tealeaf user data:** Tealeaf user information is made available to Tealeaf components through the Tealeaf data service.
   - See "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.
   - See "cxView User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.
   - See "cxReveal User Administration" in the *IBM Tealeaf cxReveal Administration Manual*.
2. **Tealeaf Status:** The Tealeaf Status report uses Tealeaf Data Service to retrieve statistical information about the Tealeaf servers and databases. See "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*.
3. **Portal Control Settings:** Configuration settings internal to the Portal are stored in the `TL_SYSTEM` database and are retrieved at startup for use.
4. **Tealeaf Canister Server Definitions:** The Portal uses the service to acquire the definitions for all Canister servers in the environment. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.
5. **RTV Search & Replay Audit Logs:** The IBM Tealeaf CX RealiTea Viewer uses the service to commit audit logs to the Portal's database which can be seen in the User Activity Reports. See "Monitoring User Activity" in the *IBM Tealeaf cxImpact Administration Manual*.
6. **NT/Active Directory User Lists:** When NT/AD authentication is enabled for Tealeaf, the Portal retrieves the list of configured NT/AD groups from the Data Service. The Data Service collects them at a scheduled interval from Search Servers in the Tealeaf system.
7. **Portal Reports:** Wherever possible, the Portal relies on the Tealeaf data service as the data source during report generation. In particular, the data service provides inputs to the following reports:
   - Tealeaf system status reports. See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.
   - Active status and events reports and the Alert Monitor. See "Monitoring Current® Tealeaf Activities" in the *IBM Tealeaf cxImpact User Manual*.
   - The Reporting Service is one component of the Tealeaf Data Service.
8. **Event and Dimension Definitions:** Events, dimensions, session attributes, and other run-time data definitions are managed through Search Server, which queries the Data Service to interact with the database tables.
   - See "Tealeaf Event Manager" in the *IBM Tealeaf Event Manager Manual*.

Installation

During the installation process, the Tealeaf Data Service is installed on the same server where the Tealeaf Data Collector is installed. The Tealeaf Data Service uses the same registry settings to self-configure and connect to the Tealeaf databases.

Database Configuration

For more information on how to configure Tealeaf databases, including re-installation as needed, see "Database Administration" in the *IBM Tealeaf Databases Guide*.

Configuring Tealeaf Data Service

Through Search Server, Tealeaf servers and services communicate with the Data Service and the Report Server by extension.

On each Tealeaf server specified in TMS, the Search Server configuration must be supplied with a method for connecting to the Tealeaf Data Service, depending on the server type:

1. **Portal Server:** The machine hosting the Portal Server must be provided a valid entry for `TeaLeaf Data Service`.
   - In most configurations, the service is installed on the Report Server, which is typically installed on the Portal Server machine. In these configurations, this value is `localhost:23000`.
   - If the Portal Server and the Report Server are split onto separate machines or if the service is installed in a non-standard server, then the value must be specified to point to the hostname and port number of the hosting server:

     `<Server_hosting_Tealeaf_Data_Service>:23000`
2. **All other servers:** All other Tealeaf servers require a valid entry for the Portal Server in their Search Server configurations.
   - These Tealeaf servers communicate through the Portal Server, which knows how to contact the Tealeaf Data Service based on the configuration in the previous step.
   - In Search Server configuration for non-Portal Server machines, the value for `TeaLeaf Data Service` should be left blank.

- For more information on configuring Search Server, see "Configuring the Search Server" in the *IBM Tealeaf CX Configuration Manual*.
- For more information on using TMS, see "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Starting and Stopping the Service

You can start, stop, and restart the Tealeaf Data Service through TMS.

Note: Since the Tealeaf Data Service provides critical data to Search Server, it must be started before Search Server and stopped after it.

1. Log in to the Tealeaf Portal as an administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. Click the WorldView tab.
4. Select `Servers` view.
5. Click the Data Service node.
6. The available commands are displayed in the Component Actions panel. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Logging

This section describes how to manage and use the Data Service log files through IBM Tealeaf Portal.

Accessing Logs

Tealeaf administrators may access the Data Service log files through the Tealeaf Portal.

1. From the Portal menu, select **Tealeaf** > **Portal Management**.
2. Click the Tealeaf Servers link in the left navigation pane.
3. Click the Manage Servers link.
4. The right side of the screen is populated with the configured Tealeaf servers.
5. Select the Report Server.
6. In the toolbar above the server configuration panel, click the Tealeaf Logs icon.

7. From the Filter By drop-down, select `Data Service`.
8. The Data Service logs currently stored on the Report Server are listed.
   - See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

You may also access the database entries for the Data Service through the Logs section in the Portal Management page. See "Portal Logs" in the *IBM Tealeaf cxImpact Administration Manual*.

Log File Location

Tealeaf Data Service generates log messages in the following log file:

`<Tealeaf_install_directory>\Logs\TLDataService.log`

The log file is rolled daily at midnight. Log files from previous days include a `YYYYMMDD` indicator in the filename.

Changing the Log Level

By default, the Log Level for the Tealeaf Data Service is set to 1, which means that the log file contains only the following types of status messages:

- Startup
- Shut-down
- Verification of connection to all databases

If needed to resolve specific issues with the Tealeaf Data Service, you can change the logging level to a value between 1 and 9. If Log Level 9 is enabled via TMS, the Data Service log file contains individual request information and additional trace/debug statements to assist in resolving issues.

The Tealeaf Data Service shares the same logging controls as other services managed through the Report Server. To change the logging level for it and other Report Server functions, set the Log Level value on the Database tab in the Report Server configuration in TMS.

- See "Configuring the Report Server" in the *IBM Tealeaf CX Configuration Manual*.

Per-Minute Data Service Stats

In addition to core logging functions, the Data Service writes statistical information on its current state to `.CSV` files in the `Logs` directory. These files provide performance information on the Data Service CPU usage, threads, handles, requests, and more.

Files are in the following location:

`<Tealeaf_install_directory>\Logs\TLDataService-Stats_YYYYMMDD.log`

This file is updated every minute and is rolled every day. The file contains the following tab-delimited fields.

Field Description

`LogTime`
Timestamp for when the entry was written to the file

`DsUptime`
Current uptime for the Data Service in minutes

`ReqsSinceStart`
Requests since the Data Service was last restarted

ReqsInLastMinute
Requests to the Data Service in the last minute

AvgReqsPerMinute
Average requests to the Data Service per minute since last restart

CPU CPU usage by the Data Service at the time the entry was written

Handles
Number of handles in use by the Data Service

Threads
Number of threads in use by the Data Service

WorkingSet
The current amount of physical memory allocated for the Data Service

PeakWorkingSet
The maximum amount of physical memory used by the Data Service since last restart

PrivateMemory
The current amount of paged memory allocated by the Data Service

PagedMemory
The current amount of paged memory allocated by the Data Service

PeakPagedMemory
The maximum amount of memory in the virtual memory paging file used by the Data Service since last restart

NonpagedSystemMemory
The current amount of nonpaged system memory allocated for the Data Service

PagedSystemMemory
The current amount of pageable system memory allocated for the Data Service

VirtualMemory
The current amount of the virtual memory allocated for the Data Service

PeakVirtualMemory
The maximum amount of virtual memory used by the Data Service since last restart

AvailWorkerThreads
The number of worker threads currently available to the Data Service

AvailCpThread
The number of available asynchronous I/O threads available to the Data Service

Configuring the Replay Server

The Replay Server manages the replay of sessions to Browser Based Replay clients. Whenever a BBR user queries for a session to replay, the query is passed through Search Server to retrieve the session, which is delivered to the user's browser through Replay Server.

Pre-Requisites

Note: In order to effectively replay the complete session, the Replay Server must have access to the static content, including images, Javascripts, and stylesheets, that are referenced in the session. Static content may be referenced from the origin server or a TLI Server. Tealeaf recommends deploying a TLI Server for static archive management. For more information on TLI servers, see "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

There may be some limitations in the replay experience due to differences in how session content is rendered for display in specific devices.

- See "Search and Replay for Mobile Web" in the *IBM Tealeaf CX Mobile User Manual*.

Installation

During initial installation, one Replay Server is installed as part of the IBM Tealeaf cxImpact installation. This server is initially designated as the master Replay Server.

As needed, additional Replay Servers may be installed and configured.

- See “Creating Additional Replay Servers” on page 78.

Portal Reference

During installation, a reference to the initial master Replay Server is added to the Portal Management page, which enables BBR users to request and receive sessions from the Replay Server through the Portal application. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Replay Server Configuration

You can view or edit the Replay Server configuration from the Portal.

Accessing the Replay Server Configuration

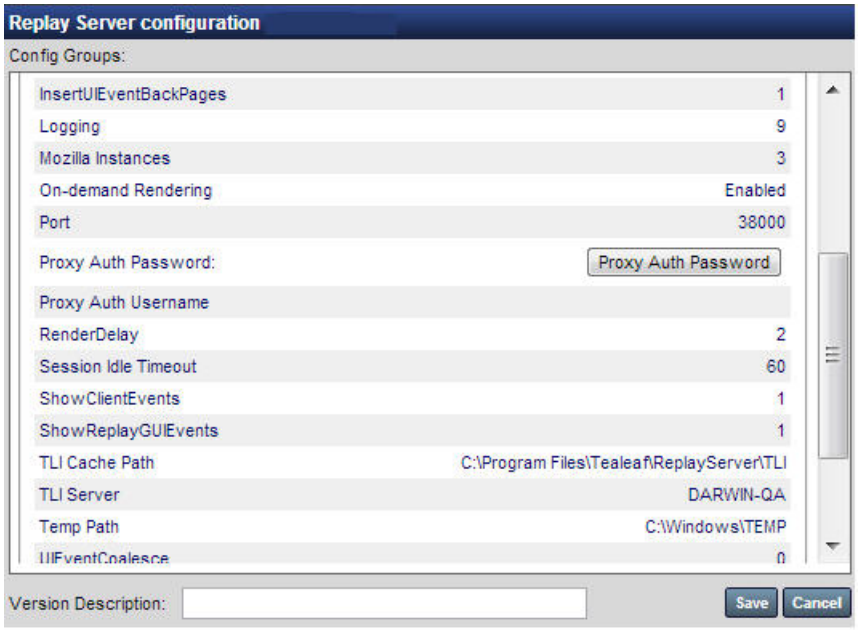
To view or edit Replay Server configuration settings:

1. Log in to the Portal as an admin user.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. From the View drop-down, select `Servers`.
4. In the Servers view, select the desired server to drill down to components.
5. Click the Replay Server node.
6. Select **Replay Server configuration**.
7. In the Config Actions panel, click **View/Edit**. The Configuration Editor is displayed.

   Note: After you make changes to the Replay Server configuration, the following steps are required:
   - Push the configuration to all servers through TMS.
   - Restart the Replay Server.

Replay Server Settings

Through TMS, the following configuration items are available.



Setting Description

`Auth Master Server`

Identifies the server that manages authentication. In environments where the Replay Server is on the same server as the Portal application, this value is `localhost`.

`Cache Timeout`

Time (in minutes) that static resources are kept in the cache. If not accessed again before the timeout expires, items are deleted from the cache.

`Chrome Instances`

Specifies the number of renderer instances using the Chrome/WebKit browser to spawn on the Replay Server.

Note: This renderer is only needed if your web application supports the Chrome browser or mobile web browser sessions.

- This definition is available in the raw configuration only.

`Days to Keep Logs`

Number of days to retain Replay Server log data. The default value is `30` days.

`DisablerendererImageLoading`

When set to `1`, **DisableRendererImageLoading** stops an image from loading during replay rendering to improve performance. If this setting is enabled, the **FakeImagesOnRender** setting is disabled.

`EnableDomCapture`

Set to `1` to enable DOM Capture, or set to `0` disable DOM Capture.

The default setting is `1` (enable DOM capture).

Enabling DOM Capture allows the Replay Server to parse DOM capture data and then use it to show Replay.

When you enable DOM capture, any UI Events that do not contain DOM capture data are hidden, though these UI events are still available to make Step Events in Request data.

For information about using DOM capture for Replay, see the *IBM Tealeaf cxImpact User Manual*.

EnableNativeReplay

Set to `1` to enable Native Replay, or set to `0` disable Native Replay.

The default setting is `1` (enable Native Replay).

Enabling Native Replay allows the Replay Server replay sessions from mobile device users.

For information about using Native Replay, see the *IBM Tealeaf cxImpact User Manual*.

Enable TLI Server

When set to `1`, the Replay Server is configured to look for static content on the specified `TLI Server` and to store TLI data on the Replay Server in a cache (`TLI Cache Path`) . See "Configuring TLI Server Usage" on page 75.

Exec UI Events Now

When enabled, UI events in the session are rendered while the hit is rendered. This configuration may assist if pages rendered in BBR appear to display UI events on the page after which the event occurred.

- By default, this setting is `False`. When set to `False`, they are rendered after the hit has been rendered.

Fake Images On Render

When set to 1, the Replay Server generates stub 1x1 pixel images to be used for all image requests, instead of retrieving real images from the origin site. By default, this option is disabled, but it can be enabled if image load time is significant.

- This definition is available in the raw configuration only.
- When enabled, stubs are generated for all requested images, even if they are archived in a TLI server. For more information on TLI archives, see "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

  Note: When enabled, this option can cause problems with pages where images styles are dynamically modified by JavaScript. These situations are not common.

IEEmulation

Specifies the Internet Explorer emulation mode used by `BBRIERenderer.exe`.

By default, `BBRIERenderer.exe` uses the Emulation Mode of the minimum version of Internet Explorer supported by Tealeaf.

If you want `BBRIERenderer.exe` to render using a different version of Internet Explorer, set the **`IEEmulation`** property to the Emulation Mode associated with the version of Internet Explorer that you want to use. `BBRIERenderer.exe` renders the IE sessions using the mode specified.

For information about emulation modes for the different versions of Internet Explorer, consult the Microsoft Developer Network article about Browser Emulation.

Note: If you change the IE emulation mode, all renderers need to be restarted by restarting the Replay Server.

Insert Missing or Cached Pages
When enabled, this option attempts to insert pages that are missing in the session or that were cached by a content delivery network (CDN) by retrieving them from the origin server. By default, this setting is disabled.

Note: This option should be enabled in isolation to rectify simple issues with replay of missing data. Enabling this setting may result in false positives, in which query parameters in the URLs for UI events cannot be matched with pages stored in the session. In these cases, this option causes the Replay Server to reach for the page from the origin server; for UI event pages, the page does not exist, which may cause replay problems.

InsertBackPages
Browsers cache previously visited pages and do not issue a request back to original server when user goes back to those pages. This option allows to synthetically insert viewable pages into navigation list when UISDK is instrumented on the website. UI events will be attached to the synthetic pages for smooth replay.

InsertUIEventBackPages
This option attempts to inserts missing back buttons pages from UI events. `InsertUIEventBackPages` uses the `Performance Init` UI event and its `WindowHref` value. It goes through the session looking for miss pages based on the `WindowHref`URL.

Logging
When set to `Yes`, logging is enabled.

MaxRenderPerSesn
This option is the maximum number of renderers that are dedicated to render a session selected out of available pool of renderers. Other renderers will not be touched to render the given session.

Mozilla Instances
Specifies the number of renderer instances using the Mozilla Gecko browser to spawn on the replay server. The default setting is `4`. You should not have to change this value.

- This definition is available in the raw configuration only.

On-demand Rendering
When enabled, only the current page and the page following are rendered until another page is requested. This improves session load time.

Port This value defines the server port through which Replay Server interactions are performed. The default value is `38000`.

Proxy Auth Password
When a proxy server is between BBR users and the public Internet, this setting specifies the password to use for authentication with the proxy.

Proxy Auth Username
When a proxy server is between BBR users and the public Internet, this setting specifies the username to use for authentication with the proxy.

RenderDelay
Render delay is the amount of time (in seconds) that the renderer will wait after the page is loaded (and UI events are run) before taking the snapshot.

After the initial page snapshot the UI events are run one at a time (snapshot after each one after renderer delay.

Session Idle Timeout
Number of minutes of permitted inactivity for a BBR session after which the session is automatically timed out.

ShowClientEvents
Navigation list includes UI Capture JSON message's Client State (Type 1) message when enabled.

ShowPerformanceEvents
Type 7

ShowInfoEvents
Type 2

ShowReplayGUIEvents
Navigation list includes UI Capture JSON message's Control (Type 4) message when enabled.

TLI Cache Path
When the TLI server is enabled (`Enable TLI Server`), this setting specifies the path on the Replay Server where objects retrieved from the TLI server are stored in a cache. See "Configuring TLI Server Usage" on page 75.

TLI Server
When the TLI server is enabled (`Enable TLI Server`), this setting specifies the name of the machine hosting the TLI server. See "Configuring TLI Server Usage" on page 75.

Temp Path
Path to directory to temp storage space for replay.

UIEventCoalesce
When enabled, this option removes redundant UI events such as click a text field from the session that is delivered during replay. Events such as these do not offer additional value.

UIEventDeleteDuplicates
To delete duplicate adjacent UI events for replay purposes, set this value to 1.

UIEventSubTypeSkip1
This list displays the potential UI Event SubTypes that you can specify to skip (value=1) or to replay (value=0). Depending on how your site is rendered, some of these sub-types may generate a significant volume of events or may not replay correctly, so these options can be used to fine-tune the BBR replay experience specific to your web application.

- For more information on these options, see "UI Event Sub-Types" on page 76.

UseBackingStore
When this value is set to 1, the Replay Server stores request data from the rendered session in a local file. When set to 0, the request data is stored in memory.

White List Enable
When enabled, you may specify whitelists of URLs that are permitted to contact the origin server for the defined domain.

- These whitelists are specified as regex patterns in the Portal Management page. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring Proxy Access for Replay Server

When a session is opened in Browser Based Replay, static content such as images and stylesheets is requested from the Replay Server. If the Replay Server does not have the content stored locally in a cache, then it requests the content from the origin server.

If a proxy server is in place between Tealeaf and the origin server, you must configure access for Replay Server to the origin server through the proxy.

- See "Troubleshooting - BBR" in the *IBM Tealeaf Troubleshooting Guide*.

Configuring TLI Server Usage

Note: If you have deployed a TLI Server in your environment, each Replay Server that you deploy must be configured to reference the TLI Server for static objects. This configuration must be applied to each Replay Server in your environment. See "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring Access to the Origin Server

Static content is not stored with the session data. When references to static content are detected in the session data, the Replay Server performs requests to the origin server based on one of the following modes.

Note: If a TLI Server has been deployed in your environment, Replay Server always checks first with its local static object cache and then the TLI Server for static content before contacting the origin server.

- See “Configuring TLI Server Usage.”

If those checks fail to return static content or if a TLI Server is not deployed, the following modes apply.

Blacklist mode

By default, the Replay Server operates in blacklist mode, in which it makes requests to the origin server for any static content. If the Replay Server is unable to satisfy the request through local resources, such as a cache or a TLI Server, then the request is made back to the origin server.

- In Blacklist mode, White List mode is disabled, and white list rules are ignored.

Note: If Replay Server is operating in Blacklist mode and you wish to prevent contact with the origin server, you can specify a BlockUrl rule in your replay profile, which prevents the Replay Server from contacting the origin server for the specified URLs. Note that blocked pages cannot be displayed during replay. See "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Whitelist mode

In Whitelist mode, Replay Server is prevented from contact the origin server by default. In many environments, contacting the origin server from the replay client is either forbidden or undesirable.

- For more information on reasons to avoid contacting the origin server, see "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

You must specify white list rules that identify the URL patterns that are permitted to contact the origin server. For each rule that you configure, one or more URLs are defined to be permitted to contact the origin server for static content for the specified domain.

For example, you can create regular expression patterns to identify the file extensions of content that the Replay Server is permitted to retrieve from the origin server. All URLs that match the regular expression pattern are permitted to contact the origin server.

Whitelist mode must be enabled on each Replay Server in your environment.

- See “Enabling whitelist rules for multiple Replay Servers” on page 80.

After you have enabled whitelist mode, you must configure white list rules. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

UI Event Sub-Types

The following UI event subtypes can be enabled or disabled for replay in BBR. When disabled, these events are hidden during replay; the data remains in the session for eventing and other purposes.

These settings apply only to the rendering of sessions in BBR. If your implementation of UI Capture has been configured to not capture a sub-type, the data is not present in the session, and changing the corresponding setting here has no impact.

- See "UI Capture j2 Guide" in the *IBM Tealeaf UI Capture for j2 Guide*.
- See "UI Capture for AJAX Guide" in the *IBM Tealeaf UI Capture for AJAX Guide*.

Note: Enabling some of these UI events may significantly increase the number of UI events rendered in a session, which can impact performance and usability in BBR. Be cautious when making changes.

Table 2. UI Event Sub-Types

Sub-Type	Description	Default
`blur`	Focus has been removed from the element.	`0`
`focusin`	Element has received focus.	`1`
`focusout`	Focus has been moved off of element.	`1`
`mousedown`	A click of the mouse button has been recorded on the element.	`1`
`mouseup`	A clicked mouse button has been released on the element.	`1`
`mousewheel`	The mouse wheel has been scrolled over the element.	`0`
`scroll`	The element has been scrolled.	`1`
`unchanged`	The element has received focus, lost it, and remains unchanged.	`0`
`attention`	The element has received attention.	`0`
`resize`	The element has been resized.	`0`
`load`	The element has been loaded on the page.	`0`

Table 2. UI Event Sub-Types (continued)

Sub-Type	Description	Default
unload	The element has been unloaded from the page.	0
mouseout	The mouse has moved out of the element.	0

Updating the Replay Server Profile for DWR POST Data Matching

If you have upgraded to Release 8.4 or later and your site is using the DWR library for Javascript/Java interactions, you must update the profile stored on the Replay Server to use the appropriate POST data matching plugin when DWR requests are detected in session data during replay. POST data matching plug-ins are used to match requests of specified content type to their corresponding responses in session data. POST data matching plug-ins enhance the probability of properly matching each request to its corresponding response. See "Managing POST Data Matching Plugins" on page 100.

DWR POSTs must be passed through the pre-existing FormData plug-in for proper matching. To configure, you must include a reference to the type of hit in the plug-in FormData configuration on the Replay Server. Please complete the following steps.

1. Login to the server hosting the Replay Server.
2. Navigate to the following directory:
   <Tealeaf_install_directory>\System
3. Edit the ReplayServerProfile.xml file.
4. Locate the following configuration. It may be at the top of the file:

```
<Plugins>
    <ReplayHitMatchPlugin name="AMF" version="8.4.0.8436" interfaceVersion="1"
errorCode="0" errorMessage="">
        <HitType contentType="application/x-amf" handlesQueryString="false"
              wantResponseData="false" haveCustomOptionsDialog="false"
              haveCustomIgnoreParamDialog="false"
              haveCustomResponseDisplay="false"
              haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
    </ReplayHitMatchPlugin>
    <ReplayHitMatchPlugin name="FormData" version="8.4.0.8436"
         interfaceVersion="1" errorCode="0" errorMessage="">
        <HitType contentType="application/x-www-form-urlencoded"
               handlesQueryString="true" wantResponseData="false"
               haveCustomOptionsDialog="false"
               haveCustomIgnoreParamDialog="false"
               haveCustomResponseDisplay="false"
               haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
    </ReplayHitMatchPlugin>
    <ReplayHitMatchPlugin name="JSON" version="8.4.0.8436"
         interfaceVersion="1" errorCode="0" errorMessage="">
        <HitType contentType="application/json" handlesQueryString="false"
               wantResponseData="false" haveCustomOptionsDialog="false"
               haveCustomIgnoreParamDialog="false"
               haveCustomResponseDisplay="false"
               haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
    </ReplayHitMatchPlugin>
    <ReplayHitMatchPlugin name="XML" version="8.4.0.8436"
         interfaceVersion="1" errorCode="0" errorMessage="">
        <HitType contentType="text/xml" handlesQueryString="false"
```

```
                wantResponseData="false" haveCustomOptionsDialog="false"
                haveCustomIgnoreParamDialog="false"
                haveCustomResponseDisplay="false"
                haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
        <HitType contentType="application/msbin1" handlesQueryString="false"
                wantResponseData="false" haveCustomOptionsDialog="false"
                haveCustomIgnoreParamDialog="false"
                haveCustomResponseDisplay="false"
                haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
    </ReplayHitMatchPlugin>
</Plugins>
```

5. The above configuration represents the configuration for the POST Data Matching plugins on the Replay Server. Locate the FormData plugin configuration. It should look like the following:

```
<ReplayHitMatchPlugin name="FormData" version="8.4.0.8436"
   interfaceVersion="1" errorCode="0" errorMessage="">
    <HitType contentType="application/x-www-form-urlencoded"
         handlesQueryString="true" wantResponseData="false"
         haveCustomOptionsDialog="false" haveCustomIgnoreParamDialog="false"
         haveCustomResponseDisplay="false" haveCustomPostDataDisplay="false"
         affinity="0.5">
        <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
</ReplayHitMatchPlugin>
```

6. Just before the </ReplayHitMatchPlugin> closing tag, insert the following configuration:

```
<HitType contentType="text/plain" handlesQueryString="false"
wantResponseData="false" haveCustomOptionsDialog="false"
haveCustomIgnoreParamDialog="false" haveCustomResponseDisplay="false"
haveCustomPostDataDisplay="false" affinity="0.5" enabled="1">
        <URLFilter pattern="" reqVar="" reqVarValue="" enabled="1"/>
    </HitType>
```

7. Save the file.
8. Through TMS, restart the Replay Server. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
9. If you have additional Replay Servers in your environment, this change must be applied to those servers.

Note: Individual users of the IBM Tealeaf CX RealiTea Viewer must apply a similar change to their local replay profiles. See "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Creating Additional Replay Servers

During IBM Tealeaf cxImpact installation, one Replay Server is created for you. This Replay Server is designated as the master server. Depending on the load on the Replay Server, you may need to install and deploy additional Replay Servers.

Note: Your Tealeaf solution must contain one and only Replay Server that is designated as the master.

When a Replay Server receives a command to open a session, one of the following occurs, depending on the status of the master Replay Server:

- The Replay Server checks to see if it is the master Replay Server. If so, it uses the local copy of the replay profile.
- The Replay Server knows that another machine is the master Replay Server and retrieves the master profile from it.

  - If the master Replay Server is unavailable, the requesting Replay Server uses its local copy.
  - If the master Replay Server is available, the retrieved profile is stored locally, in case it becomes unavailable at some future point.
- The Replay Server can't discover which server is the master Replay Server. In this case, the requesting server uses its local copy of the profile.
  - At startup, the requesting Replay Server logs an error message in the Windows event log.

Note: One Replay Server must be designated as the master server.

- If you have multiple Replay Servers and deactivate the master server, the Portal automatically designates another Replay Server as the new master.
- If you have only one Replay Server, you cannot deactivate it, since it is the master server by default.

Basic Workflow

Assuming that you have already installed at least one IBM Tealeaf CX Server, the following basic steps outline how to add a Replay Server.

1. Acquire (if needed) and install new hardware to host the Replay Server.
2. Install a Portal-only on the new server.
   a. In the IBM Tealeaf cxImpact Installer, select the Portal-only option.
   b. Complete the installation.
3. In `CanSvcs.cfg`, set all non-Replay Server services to manually restart:
   a. Search Server
   b. Data Collector
   c. Data Service

   Note: The only services to retain are TMS, Search Server and Replay Server.
4. All non-Replay Server services must be configured to Manual start through the Windows Services control panel on the host machine.
5. Add the server through the Portal Management page. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

For details, please read the following sections.

Assessing Replay Server Load

In an environment with multiple Replay Servers, sessions are managed and served to BBR users in a round-robin fashion among the active Replay Servers.

- When a BBR user requests a session for replay, the session is served by the next Replay Server based on current load, and the serving Replay Server is moved to the bottom of the list.
- Every twenty seconds, the load list is rebuilt based on the current load of each server. The server that most recently served a session is always placed at the bottom of the list.

Note: In general, if you are experiencing sluggishness during replay or slowness in the loading of a new session, you may be able to improve performance by adding a new Replay Server.

Installing Additional Replay Servers

Before you create a reference to additional Replay Servers in the Portal, please verify that the following components have been installed on the designated server.

These components are available in the IBM Tealeaf cxImpact installer, using the Report Server and Portal Web Application component.

- See "CX Installation and Setup" in the *IBM Tealeaf CX Installation Manual*.

Disable Interactive Services Detection

For the WebKit/Chrome renderer to function properly, the Interactive Services Detection service on the server hosting Replay Server must be disabled.

Note: When you add a new Replay Server, the Interactive Services Detection service must be disabled to prevent conflicts with the WebKit/Chrome renderer.

- If you enable the Replay Server on a server already hosting Tealeaf software, you may need to manually disable this service. See "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*.
- If you are installing the Replay Server using the Installer, it automatically disables the service.

Replay Server must run as Local System

The Replay Server must be configured to run as the Local System user on the server.

- See "Post-Upgrade Cleanup" in the *IBM Tealeaf CX Upgrade Manual*.

Configuring Replay Servers Instances

After the software has been installed on the designated server, you must add a reference to the new Replay Server through the Portal Management page. For each Replay Server, you must create a reference for it in the Portal.

Note:

- One Replay Server must exist in the Portal.
- One Replay Server must be designated as the master server.
- Each Replay Server must be configured to use the TLI Server, if deployed. See “Configuring TLI Server Usage” on page 75.

Enabling whitelist rules for multiple Replay Servers:
Through the Portal Management page, you can configure whitelist rules. When these rules are defined, all matching URLs are allowed to contact the origin server for content, which allows you to prevent other URLs from contacting the server and triggering server-side actions based on replay contact.

Note: Whitelist rules must be enabled and configured on each Replay Server in your environment.

To configure whitelist rules for multiple Replay Servers, please complete the following steps.

1. On the master Replay Server, configure your replay whitelist rules.
   - See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.
2. Test these rules to verify that they are functioning properly.
3. If you have not done so already, in the Portal Management page, define the slave Replay Servers.
4. Through TMS, enable whitelist rules on the slave servers.

a. In the Portal menu, select **Tealeaf** > **TMS**. The Tealeaf Management System is displayed. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
b. In TMS, click the WorldView tab.
c. From the View drop-down, select `Servers`.
d. For each server hosting a Replay Server instance:
    1) Select the server.
    2) Click the Replay Server node.
    3) Click **Replay Server configuration**.
    4) Click **View/Edit**.
    5) Click the `Whitelist Enable` option.
    6) Set this value to 1.
    7) Click **Apply**.
    8) Click **Save**.
    9) Click **Add to Current Job**.
e. Repeat the above steps for each Replay Server in the environment.
f. When all Replay Servers have been updated, click the Jobs tab in TMS.
g. Select the job and click **Submit**.
h. All Replay Servers are now enabled to use whitelists.

5. Test replay on the slave servers to verify that the white list rules are being applied.

See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring Replay Rules

The Replay Server supports the creation of a custom set of replay rules to apply to BBR sessions. These rules are managed by the master Replay Server, which publishes them on request to the other slave Replay Servers. See "BBR Replay Rules" in the *IBM Tealeaf cxImpact User Manual*.

If you are deploying white lists in an environment with multiple Replay Servers, additional configuration is required. See “Enabling whitelist rules for multiple Replay Servers” on page 80.

On-Demand Privacy

Optionally, you can configure privacy rules to apply to replay through the Replay Server. This feature enables the blocking or masking of sensitive data from replay while maintaining the data as part of the session record.

- See “On-Demand Privacy” on page 133.

Replay Server Plugins

To manage the matching of requests to responses in a session, Tealeaf provides a set of plugins for the Replay Server, which can be used to match post data to the appropriate response during replay. These plugins manage the matching for specific content-types.

- See “Managing POST Data Matching Plugins” on page 100.

Native Replay in BBR

Replaying sessions from mobile devices requires Tealeaf to convert JSON data to HTML.

Tealeaf uses a set of templates to convert JSON to HTML.

The following sections describe:

- The JSON input, including an illustration of the structure of a JSON message
- The Tealeaf templates, including a description of the Tealeaf template (TLT) directory
- The template language
- The template library functions
- How Tealeaf uses the templates to convert JSON data to HTML
- The template parser tool
- Tealeaf template customization

JSON data and Tealeaf templates

Tealeaf templates process JSON data that is generated by the mobile device and convert that data into HTML. The template expressions can reference JSON.

Templates accept two sources of input from JSON data. These inputs are:

- **Environment input**

  Environment input is the static (unchanging) information that is contained in the JSON header.

  Examples of Environment input include:

  ```
  osType
  osVersion
  msgVersion
  j2hVersion
  clientEnvironment
  ```

  Environment input is accessed with the dollar sign ($), for example, [$*valueName*].

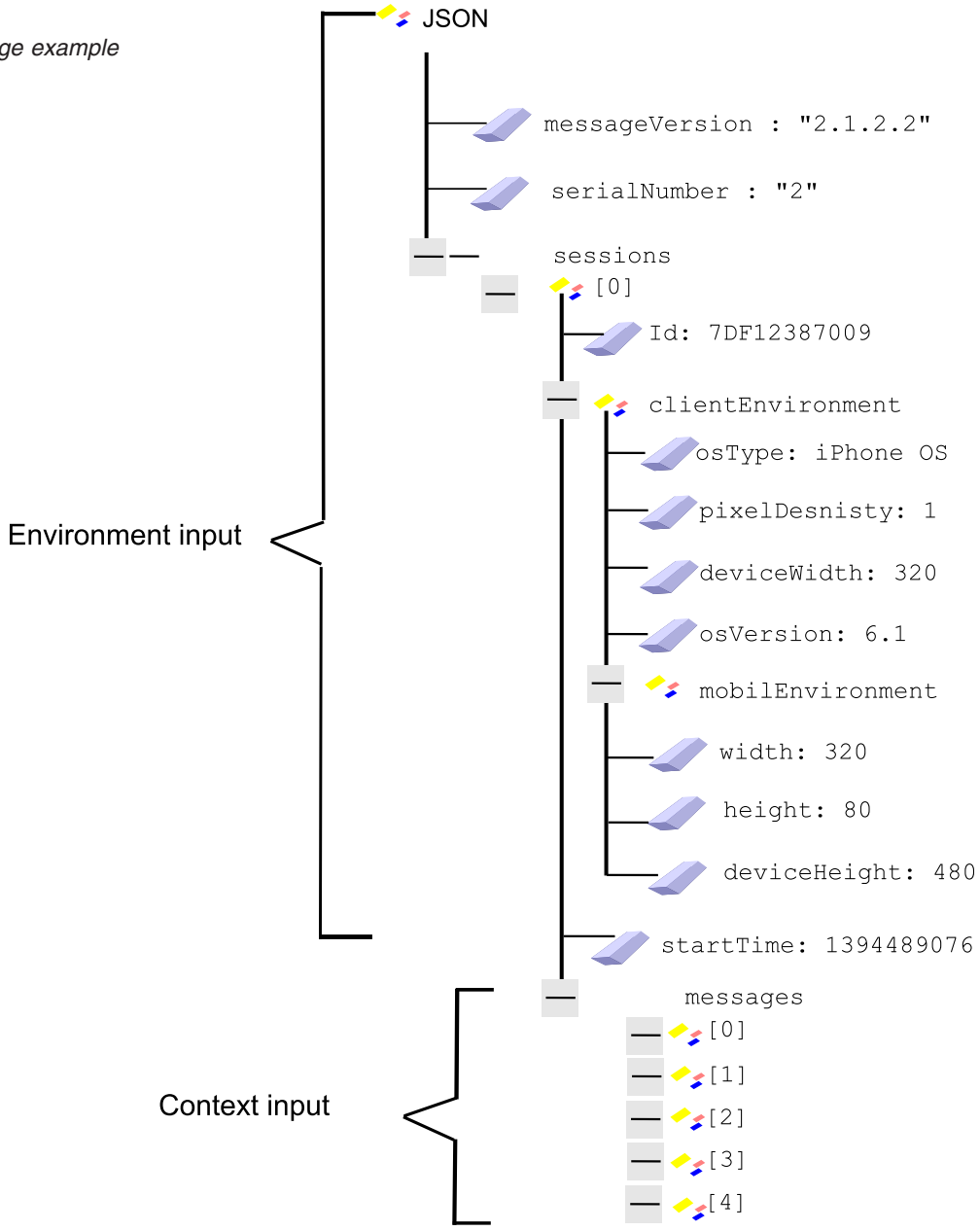
- **Context input**

  Context input is the single type 10 JSON message being processed.

  The context input is used by the templates to render data and contains layout and control information.

  Context input is accessed without the dollar sign ($), for example, [*valueName*].

Figure 12. JSON message example



Replay server templates

IBM Tealeaf ships with `ReplayServer` templates.

These templates are installed to the `ReplayServer\TLT` directory when you install IBM Tealeaf.

```
C:\Program Files (86)\IBM Tealeaf CX\ReplayServer\TLT
                                                \android (folder)
                                                \ios (folder)
                                                \readme.txt (file)
                                                \type10.html (file)
```

Figure 13. Directory path to the Replay Server templates

The directory path (`ReplayServer\TLT`) and the `type10.html` file are the only things in the template system that are hardcoded.

In IBM Tealeaf, replaying Native Mobile sessions relies on the type10.html template and other template files called from type10.html to render mobile session data (in the form of JSON Type 10 messages) to HTML.

You can edit the template files in ReplayServer/TLT to control how the JSON data is converted to HTML. Type10.html delegates to templates in the **iOS** or **Android** subdirectories and is root of all JSON-to-HTML conversions.

Note: Customizing the JSON-to-HTML conversion process by modifying the templates in ReplayServer/TLT has certain drawbacks. You will likely have to re-implement any changes you make to the templates when a new version of IBM Tealeaf is installed. For information about customizing the JSON-to-HTML conversion ***without*** modifying these templates, see Template customization for Native replay.

A description of the folders and files in the TLT subdirectory follows:

android folder
This folder contains the template files for the Android device.

iOS folder
This folder contains the template files for the iOS device.

type10.html
The type10.html file converts type10 messages (JSON message) to HTML.

You can modify the contents of the type10.html to control JSON data rendering in BBR.

The type10.html file branches into either the **iOS** folder or the **android** folder.

Figure 14. Example of code in type10.html for determining which folder to delegate

```
{{
if(
eq([$"osType"],"Android"),
template([], "android\\root.tlt"),
template([], "ios\\root.tlt")
)
}}
```

In Figure 14, the Type10.html template consists entirely of a single expression that is delimited by {{ }} characters.

The environment value osType is tested to see whether it is equal (eq) to the string Android.

If this test passes, the complete context value, represented as [], is passed into the root.tlt template in the android directory. Since the root of a single Type 10 message is passed as the context, this is what is sent to that sub template. Alternately, if the test fails, the Type 10 message is passed to a template under the ios directory.

How Tealeaf templates convert JSON data to HTML:

In a process similar to ASP and JSP, Replay uses the templates to convert JSON to HTML. The conversion is not hardcoded. The templates are the customization point and the file type10.html is the root of the conversion process.

The templates are located in `ReplayServer/TLT` and consist of fixed or static text and inline expressions, into which Replay can substitute other values.

Note: For information about the Tealeaf Template (TLT) directory structure, see Replay server templates.

The processing sequence for converting JSON data to HTML is as follows:

1. The entire `type10` JSON message is passed to the `Type10.html` template.

   `Type10.html` is the root of the conversion process.
2. The `Type10.html` template reads the `type10` JSON message to determine if it is coming from an Android or iOS device.
   - If `Type10.html` determines that the message is from an Android device, it passes the entire `type10` JSON message into the `android\\root.tlt`.
   - If `Type10.html` determines that the message is from an iOS device, it passes the entire `type10` JSON message into the `iOS\\root.tlt`.

   The `iOS\\root.tlt` and `android\\root.tlt` are templates in-and-of-themselves that can emit some HTML and can also pass all or part of the JSON message into other templates.

The following diagram illustrates how Replay uses templates to convert JSON to HTML.

Note: Template expressions are delimited with leading {{ and trailing }} set of braces.

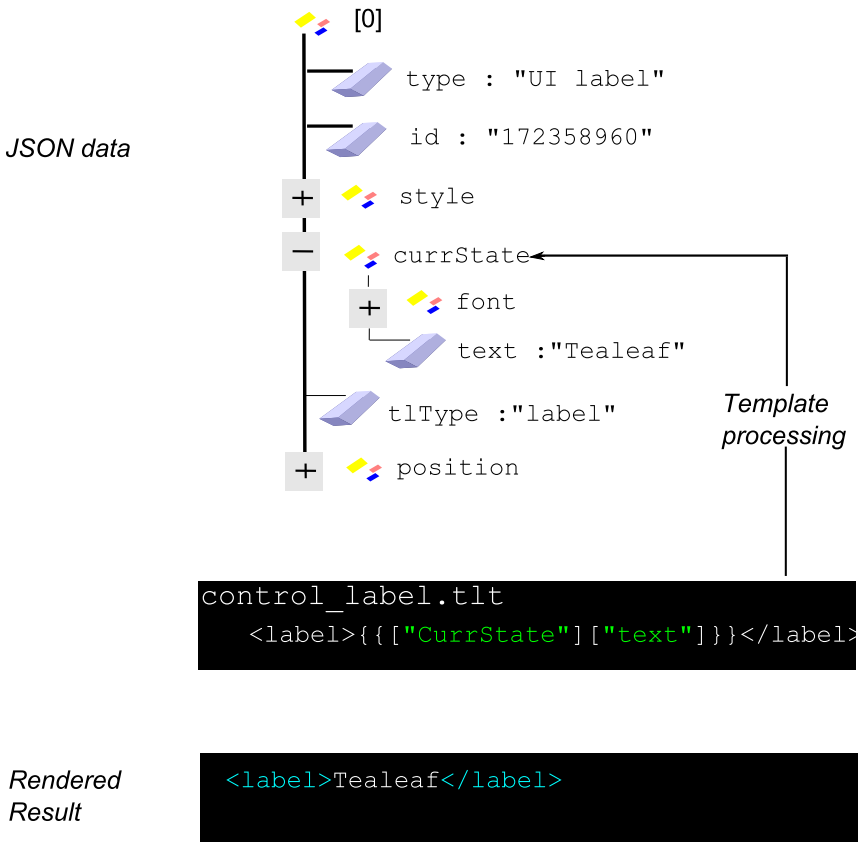


Figure 15. Converting JSON to HTML

In Figure 15, the HTML `<label> </label>` is fixed text. {{ and }} delimit the expression. The expression itself is `["currState"]["text"]`.

As an example, the result of rendering this template might be:

```
<label>Tealeaf</label>
```

A template might contain any amount of fixed text and any number of delimited expressions. JSON data from the logging framework post is rendered by the templates to produce HTML.

How Replay renders JSON data as HTML in BBR

Replay interprets the JSON data in a session that was posted to TealeafTarget by the mobile logging framework.

The JSON data posted by the logging framework includes a series of messages that describe events that occurred within the mobile application. Each message has a numeric type that indicates what type of information that message contains. For information about the JSON structure, see Replay server templates.

Replay relies on several parts of the JSON post.

- Header information that describes the mobile application and device.
- Type 10 messages that describe the platform native controls on the screen at a moment in time.
- Type 4 messages that describe changes in the state of controls on the screen.

In Browser Based Replay, web sessions are organized into Pages and UI events, with UI events nested under their pages. When you replay a mobile application session, Browser Based Replay reuses this same paradigm with Type 10 messages that are presented as pages and with Type 4 messages that are represented as UI events nested under those pages.

To make the JSON data in Type 10 and Type 4 messages easy to understand, Type 10 messages are converted into HTML, and Type 4 messages are drawn onto that HTML. To enable this, each control is given a unique identifier that remains the same across both Type 10 and Type 4 messages.

For example, a Type 10 message might indicate the presence of a **Textbox** control on the mobile application screen with a certain value, and a subsequent Type 4 message may indicate a change in the value of that **Textbox**.

In Browser Based Reply, the Type 10 message is represented as a page in the **Navigation List**, and the replay of that page is the result of the conversion from the Type 10 message into HTML. The Type 4 message is represented as a UI event under that page, and the replay of that UI event shows the Type 10 page but with the **Textbox** value updated and the **Textbox** appearing with the green highlighting that is characteristic of UI events.

Template language:

IBM Tealeaf mobile app session replay template language uses a functional programming model.

The mobile app session replay template language has the following chracteristics.

- Each template language macro consists of a single expression that consists of nested function calls, which results in a Json value that is rendered as the output.
- No existing values can be modified; only the creation of modified copies is allowed. Therefore, parameters of functions cannot be modified.
- Functions can have no side-effects.
- Every function or jpath navigation either returns a json value or throws an exception as its only result or effect.
- Parameters that are not used are guaranteed to never be evaluated. For example, in `default()`, `if()` or `foreach()` functions (or any place else).
- The template language provides exception-based error handling where any errors that occur when processing an expression will generate an exception. If the exception is recoverable, (for example, a jpath navigation element that does not exist), it may be handled by a `default()` function. Other exceptions such as parsing errors or json parameters of the wrong type passed to a function will generate "non-defaultable" (fatal) exceptions that cannot be caught by default() but which is caught by the Replay Server.

Template language constructs:

The mobile app session replay template language is composed of three constructs; inline JSON literal values, Jpath style JSON navigation that is enclosed in square brackets, and composition of predefined function calls.

Inline JSON literal values

Inline JSON literal values are quoted strings; integers; doubles floats and real; the constants `true`, `false`, and `null`; and arrays and objects that are all converted to JSON values.

JSON uses `[ value, value, value ]` to specify arrays, but if that is used for inlining JSON arrays, it would create a parser ambiguity with jpath navigation, so inlined array value constants must be specified with parenthesis instead as `( value, value, value )`. The output contains JSON square brackets `[]` if an array is output.

String constants are JSON strings and must not include any " (quotation), \ (backslash), or control characters (for example, newline, form-feed, tab) in the strings. The JSON string escape sequences are provided except for `\uxxxx` (hex unicode code point).

```
\"  quote
\\  backslash
\/  forward slash (optional / may be used without escapting)
\b  backspace
\f  form-feed
\n  newline
\r  carriage return
\t  horizontal tab
```

Example

```
{{ "JSON text string \n" }}
{{ 5 }}
{{ 5.6 }}
{{ 5.6e10 }}
{{ true }}
{{ false }}
{{ null }}
{{ ( 6, 8.2, "value", true, false, null ) }} outputs as [6,8.2,"value",true,
false,null]
{{ {"a" : 3, "b" : true, "c" : (5, 2, 3), "d" : { "e" : 2, "f" : 3}} }}
outputs as: {"a":3,"b":true,"c":[5,2,3),"d":{"e":2,"f":3}}
```

Jpath style JSON navigation enclosed in square brackets

This construct has the following variants.

`[]` (empty brackets) indicate the root of the JSON tree that is passed when starting the template. In most cases, the root context is the default and `[]` is optional.

`["value-name"]` indicates a value with the specified name within a JSON object.

`[3]` indicates the fourth value of a JSON array (0 based index).

`[@"iter-name"]` indicates the name of a limited-scope iterator or variable. These are used with `foreach()`, `let()`, and `filter()` function calls.

[$"env-var-name"] indicates an environment variable value. These values are made available through the template engine, but the values are determined and provided by the program that starts the template engine. Expected usage of these values is for version information of various aspects of the system or other data that is not contained within the root JSON value. Determination of which environment

variables are present should be based on the value of the [$"j2hVersion"] variable because J2H is responsible for setting these values.

Current environment values that are provided by the ReplayServer and J2H are:

- [$"osType"] is either Android or iOS.
- [$"osVersion"] is version of the Android or iOS operating system.
- [$"msgVersion"] is the version of the JSON message that is used for the type-10 message and [$"clientEnvironment].
- [$"j2hVersion"] is the version of j2h.dll that started the template engine. This value is primarily used to determine what other environment variables should be present.
- [$"clientEnvironment"] is the "clientEnvironment" object from the header of the JSON message that also included the type-10 message that is passed as the primary value. Use the [$"msgVersion"] value to determine what values should be present in this value.

Example

```
{{ ["layout"]["controls"][0]["tltype"] }}
     is equivalent to:
{{ []["layout"]["controls"][0]["tltype"] }}
```

Note: Frequently, the JSON navigation is the only thing inside {{...}}. In that case, the contents of that JSON value are substituted for the expression.

Composition of predefined function calls

Note: User-defined functions are not supported.

Note: Values/sub-expressions that are never used are never executed. For example, the else portion of an if() expression where the predicate condition evaluates to true.

All functions return a JSON value or throw an exception, and take only expressions that resolve to JSON values as arguments.

Some exceptions can be caught and handled by the default() function. Examples of these exceptions are json-navigation array range or missing object values. Other exceptions cannot be intercepted by default() and are fatal. Examples of these exceptions are parsing errors or json-navigation through invalid JSON value types. These exceptions always cause a failure for that template and any template parents/ancestors that instantiated it. These exceptions are caught by the Replay Server, which logs the appropriate information and generates html that indicates the error.

Predicate values are evaluated as true if a bool value is true; an int or uint value is not zero; or a string, object, or array value is not empty.

Template library functions:

Mobile app session replay templates have various functions you can use to customize your session replay.

Version functions

getTemplateLanguageVersion()
Returns a version string that indicates the version of the template language.

The current version is 1.0.0.0.

See also the `versionXX()` comparison predicate functions.

getTemplateLibraryVersion()
Returns a version string that indicates the version of the template library.

The current version is 1.1.0.0.

See also the `versionXX()` comparison predicate functions.

Predicate functions

These functions return a Boolean true/false value.

JSON type id functions:
isNull(jsonValue)
isBool(jsonValue)
isInt(jsonValue)
isUInt(jsonValue)
isIntegral(jsonValue)
isDouble(jsonValue)
isNumeric(jsonValue)
isString(jsonValue)
isArray(jsonValue)
isObject(jsonValue)
These JSON type id functions return true only if the value's type is the type at the name of the function end.

`isIntegral()` and `isNumeric()` are compound tests that return if the type is of the multiple types.

isEmpty(jsonArrayValue)
Returns true if the array is empty or false if it is not.

eq(jsonValue1, jsonValue2)
Compares two JSON values for equality. `jsonValue1` and `jsonValue2` might be any JSON type.

fileExists("filename")

Returns `True` if the given file name file exists and `False` if the given file name does not exist.

Can be used along with `readRawFile()`, `readJsonFile()`, and `template()`.

Note: The *"filename"* might include a path, but that path name specified must begin with the directory that contains the templates and the file must be contained in that directory or a subdirectory.

lt(jsonValue1, jsonValue2)
le(jsonValue1, jsonValue2)
gt(jsonValue1, jsonValue2)
ge(jsonValue1, jsonValue2)
Compares ordinal relationship of two values. `jsonValue1` and `jsonValue2` must either both be numeric types, or must both be strings.

Returns true if the ordinal relationship between `jsonValue1` and `jsonValue2` match the named condition and false if they do not.

String comparison is strictly lexical and sorted by ascii / UTF-8 numerical values.

exists(jsonObject, "valueName1" [, "valueName2" [, "valueName3"]])
This predicate function indicates whether the named values exist in a JSON object.

Returns false if either the `jsonObject` is not an object, any of the named values (except for the last) are not objects, or if any of the `"value-name"` arguments are not present in the object indicated by the parameter that precedes it.

A single call can be used to verify existence up to three levels deep with the variants that take multiple `"valueName"` parameters. In that case, the objects are searched in sequence so that if `"valueName1"` refers to an object in `jsonObject`, the object referred to by `"valueName1"` is then checked for the existence of a value named `"valueName2"`. If that value is an object that object is then checked for the presence of a value, that is named `"valueName3"` if `"valueName3"` was also specified.

Example

```
if( exists( [], "layout"), template( [] ["layout"],"layout.tlt"))
if( exists( [], "layout", "coordinates", "x" ), concat("\n<!-- X is : ",
["layout"]["coordinates"]["x""], "-->\n") )
```

valueInArray(jsonValue, jsonArray)
Returns true if at least one value in the jsonArray returns true when compared with jsonValue for equality.

Example

```
if( valueInArray( [][tlType], ("button", "canvas", "label", "grid")
),  ("exists", "does not exist")   valueInArray( (3, 5, 7),    ( (1,
2, 3), (4, 5, 6), (3, 5, 7)) )
```
Returns true.

versionEQ(jsonVersionString, jsonVersionString)
versionNE(jsonVersionString, jsonVersionString)
versionLT(jsonVersionString, jsonVersionString)
versionGT(jsonVersionString, jsonVersionString)
versionLE(jsonVersionString, jsonVersionString)
versionGE(jsonVersionString, jsonVersionString)
Compares two version strings made up of 1 or more integers that are separated by `.` or `,`, for example, of the form `##.##.##` or `##,##,##`. This function returns true of false depending on the condition reflected by the function name and the string values.

See also the `getTemplateLanguageVersion()` and `getTemplateLibraryVersion()` functions.

Note: If two version strings contain a different number of integers, only the integers that they have in common are compared. For example, `5` can be thought of as `5.*.*.*.*`. `5.6` and `5` are equal. If this behavior is undesired, then adding extra ".0"(s) onto the potentially shorter version string (or both) guarantees strict ordering (For example, "5.6" and "5.0.0.0" are "not equal").

Example

`versionEQ("5.6" , "5.6.3")`
Returns true.

`versionNE("5.6" , "5.6.3")`
Returns false.

`versionLE("5.6" , "5.6.3")`
Returns true.

`versionGT("5.6" , "5.6.3")`
Returns false.

`versionLT("5.6" , "5.6.3")`
Return false.
Although mathematical logic would say 5.6<5.6.3 is true, the semantics of the version comparison logic says that only the number of shared digits are compared. Therefore, the comparison is really 5.6<5.6, which is false.

`versionGE("5.6" , "5.6.3")`
Returns true.
Although mathematical logic would say 5.6>= 5.6.3 is false, the semantics of the version comparison logic says that only the number of shared digits are compared. Therefore, the comparison is really 5.6>=5.6, which is true.

Boolean logic functions

and(predicate-expression, predicate-expression)
Returns true if both `predicate-expressions` evaluate to `true` and returns `false` if either `predicate-expression` evaluates to `false`.

Note: The left predicate is evaluated first and if that expression evaluates to `false`, the right predicate expression is not evaluated and `false` is returned.

or(predicate-expression, predicate-expression)
Returns `true` if either `predicate-expression` evaluates to `true` and `false` if both expressions evaluate to `false`.

Note: The left predicate is evaluated first and if that expression evaluates to `true`, the right predicate expression is not evaluated and `true` is returned.

xor(predicate-expression, predicate-expression)
Returns `true` if one of the `predicate-expressions` evaluates to `true` and the other to `false`. Otherwise, it returns `false`.

Note: This function is equivalent to `not(equals(predicate-expression, predicate-expression) )`.

not(predicate-expression)
Returns `true` if the `predicate-expression` evaluates to `false` and returns `false` if the expression evaluates to `true`.

Math functions

add(jsonNumericValue, jsonNumericValue)
If both numeric parameters are integer, this function performs an integer addition and returns the integer result. If either parameter is floating point, a floating point addition is performed and the result is floating point.

sub(jsonNumericValue, jsonNumericSubtractedValue)
If both numeric parameters are integer, this function performs an integer subtraction and returns the integer result. If either parameter is floating point, a floating point subtraction is performed and the result is floating point.

mult(jsonNumericValue, jsonNumericValue)
If both numeric parameters are integer, this function performs an integer multiplication and returns the integer result. If either parameter is floating point, a floating point multiplication is performed and the result is floating point.

div(jsonNumericValue, jsonNumericDiviserValue)
If both numeric parameters are integer, this function performs an integer division (truncated) and returns the integer result. If either parameter is floating point, a floating point division is performed and the result is floating point.

remainder(jsonIntegerValue, jsonIntegerDivisorValue)
Returns the integer remainder of the first parameter divided by (modulo) the second parameter. Both parameters must be integers.

numericToFloat(jsonNumeric)
Converts any numeric type (integer, unsigned, real/float, Boolean) to a JSON real/float value. The expected use is to convert an integer parameter to a floating point number so that a subsequent math operation (for example, `div()`) returns a fractional result instead of truncating the result.

Example

```
roundFloatToInt( div( ["anIntValue"], numericToFloat(
["anIntDivisor"] ) ) )
```

stringToFloat(jsonString)
Parses a jsong string that contain a floating point number and returns it as a JSON numeric value.

Example

```
stringToFloat("5.3")
```
Returns 5.3.

truncateFloatToInt(jsonFloat)
Takes a floating point JSON value and truncates it to an integer value.

Examples

```
truncateFloatToInt( 5.8 )
```
Returns 5.

```
truncateFloatToInt( -5.8 )
```
Returns -5.

roundFloatToInt(jsonFloat)
Takes a floating point JSON value and rounds it to the nearest integer value.

Examples

```
roundFloatToInt( 5.8 )
```
Returns 6.

```
roundFloatToInt( -5.8 )
```
Returns -6.

min(jsonNumericExpr, jsonNumericExpr)
max(jsonNumericExpr, jsonNumericExpr)

Returns the larger or smaller of two numeric values. Values are converted to doubles for comparison, but the original value with its type preserved is returned.

Note: Boolean false converts to 0 / 0.0 and true converts to 1 / 1.0.

Examples

`min( 5, 5.5)`
Returns an int value of 5.

`max( 5, 5.5)`
Returns a float value 5.5.

`min( false, 3)`
Returns the boolean value false.

arrayMin(jsonArray [, "iter-name", accessorExpression])
arrayMax(jsonArray [, "iter-name", accessorExpression])

Returns the smallest or largest value in an array. If the single argument version is used, the jsonArray is presumed to be a simple array of numeric values. The optional `iter-name` and `accessorExpression` parameters can be used to access elements that are contained deeper in the array structure when the `jsonArray` contains more complex JSON structures.

Example

`arrayMin( (5, 7, true, 4.3 ) )`
Returns boolean true.

`arrayMax( arrayOfControls, "iter", [@"iter"]["ctrl"]["height"])`
Return the maximum height of a control in an array of controls.

Note: This function is equivalent to `arrayMax( foreach( arrayOfControls, "iter", [@"iter"]["ctrl"]["height"]) )`.

str(jsonNumericValue)

Returns a JSON string value that contains a serialization of a numeric value. Boolean values serialize to `true` or `false`.

Template logic functions

size(jsonArrayOrObject)

Returns the number of elements in an array or object.

getMemberNames(jsonObject)

Returns a JSON array that contains the names of the values that are contained in the `jsonObject` parameter.

To iterate over the elements contained in an object

`foreach( getMemberNames(jsonObject) , "iter", jsonObject[ [@"iter"] ] )`

assert(predicate-expression, message-string-expression [, assertPassExpression])

If the `predicate-expression` evaluates to `false`, the `message-string-expression` is evaluated and an unrecoverable exception is thrown that contains the resulting string for handling by the Replay Server.

If the `predicate-expression` evaluates to `true`, the optional `assertPassExpression` is evaluated if it is present and its result is returned. If the optional `assertPassExpression` is not specified, an empty string is returned.

Note: The expected usage of the two argument version of the `assert()` function is the sole function call within a stand-alone expression, whereas the three argument version of `assert()` is for use in the context of a more complex expression.

```
{{
assert(versionLT([$"templateLangVersion"], "2"),
              concat("these templates only tested on version 1.x of
              template language; template language version is : " ,
              [$"templateLangVersion"] ) )
}}

{{ if(equals([$"osType"],
      "Android"), "osType is Android",
       assert (equals([$"osType"],"iOS"), concat("invalid value for
       osType", [$"osType"]) ,
       "osType is iOS")
      )
}}
```

arrayConcat(arrayOfStringValues [, separatorStringValue])

Each value that is contained in the `arrayOfStringValues` parameter is concatenated into a new string value. If the optional `separatorStringValue` parameter is specified, that value is inserted between each value of the array in the rendered output.

concat(value1, value2 [, value3 [, value4]])

2 - 4 string values may be specified that will be concatenated into a single string. If more than four string values need to be concatenated, then nested calls of `concat()` can be used.

template(jsonSubTree/Object, "template filename" [,defaultStringValue])

Loads, processes and renders the result of a template instantiation into a Json string object. If the **`defaultStringValue`** is specified, it will be evaluated and returned only in the case that the **`"template filename"`** does not exist, but not for any other errors (e.g. a parsing error).

Note: The **`"template filename"`** can include a path, but that path must be specified starting with the directory containing the templates and the file must be contained in that directory or in a subdirectory.

Note: The 3 argument variant was added with template library version 1.1.0

default(expression, expression-on-error)

Allows error/exception handling for certain (recoverable) errors/exceptions. If an expression has a recoverable error, `expression-on-error` is evaluated, and its result is used instead.

Note: Use of `default()` should be avoided, when possible. It catches all defaultable errors whether the error is the one that was expected and hides problems in the templates, and makes debugging of the templates much more difficult. Use `if(..., )`when feasible to test for the condition that would be expected to cause an error and provide the default behavior there instead of with `default()`.

If a condition triggers the `default()` frequently, performance might be impacted compared to testing for the condition in advance.

if(predicate-expression, then-expression, else-expression)

The JSON value returned by the `if()` function is either the result of the `then-expression` or the `else-expression`, depending on the value that is

returned by the predicate expression. The predicate expression evaluates to true if a boolean value is `true`, an integer or unsigned integer that is not equal to 0, or a string or array is not empty.

Analogous to the C/C++ ternary operator:

```
predicate ? true-value : false-value;
```

let("variable-name", expression-to-assign, expression-using-variable(...[@"variable-name"]...))

This function is a limited, scoped assignment of a value to a temporary variable that is valid only for the evaluation of the expression that is the third parameter to the `let()` statement. The result of the `expression-using-variable` becomes the returned value from `let()`. The `"variable-name"` is the plain-text of the name within `expression-using-variable`. That value is then accessed with `[@"variable-name"]`.

Example

```
let("hexClr", htmlColor(["color"]),
default(some-expression-using([@"hexClr"]), concat("problem rendering
with ", [@"hexClr"]))
)
```

Note: Typically the `expression-using-variable` that is the third parameter to a `let()` call is moderately complex.

foreach(json-array, "iter-name", expression(...[@"iter-name"]...))

This function iterates over the `json-array` parameter and assigns each element of the array to the iterator-name one at a time and evaluates expression with that context. The JSON value that results from each evaluation of the array is assigned to the corresponding element of a result array. For example, an input array with 11 elements produces a result array with exactly 11 elements. If any of the evaluations result in an unhandled exception, all results are discarded and the result is the exception.

filter(json-array, "iter-name", predicate_expression(...[@"iter-name"]...))

This function iterates over an array much like `foreach()` except that the expression is a predicate-expression where the result indicates whether the corresponding element of the `json-array` parameter should be copied to the result array. For example, if an input array has 11 elements, the resulting array has 0 - 11 elements, depending on the predicate expression. If any of the evaluations results in an unhandled exception, the result-array is discarded and the result is the exception. The `predicate_expression` evaluates to `true` if a Boolean value is `true`, an integer or unsigned integer is not equal to 0, or a string or array is not empty.

readJsonFile("json filename" [, defaultJsonValue])

Returns a JSON value parsed from a file containing a single JSON value, which might be JSON primitive value (e.g. `string`, `integer`, `float`, `true`, `false` or `null`) or a more complex value composed with JSON objects or arrays (but must still be a single value).

If the optional **`defaultJsonValue`** parameter is specified, it is evaluated and its value returned only if the *"json filename"* specified does not exist.

Note: The *"jason filename"* can include a path, but the path name that is specified must begin with the directory that contains the templates and the file must be contained in that directory or in a subdirectory.

readRawFile("filename" [, defaultStringValue])

Loads the specified file and returns the contents as a JSON string.

If the optional **defaultStringValue** parameter is specified, it is evaluated and a value is returned only if **filename** does not exist.

Note: The *"filename"* can include a path, but that path must be specified starting with the directory containing the templates and the file must be contained in that directory or in a subdirectory.

readJsonFile("json filename" [, defaultJsonValue])
Returns a JSON value parsed from a file containing a single JSON value (which can be a JSON primitive value (e.g. `string`, `integer`, `float`, `true`, `false`, or `null`) or a more complex value composed with JSON objects and/or arrays (but must still be a single value). If the optional **defaultJsonValue** parameter is specified, it is evaluated and its value returned only if the specified **json filename** does not exist.

Note: The *"json filename"* can include a path, but that path must be specified starting with the directory containing the templates and the file must be contained in that directory or in a subdirectory.

HTML generation functions

htmlColor(jsonIntValue)
Returns a JSON string that contains a hex representation of the integer parameter that is suitable for specifying a color in HTML. The `jsonIntValue` must be between 0 and 0x00FFFFFF (decimal 16777215).

htmlEscape(jsonStringValue)
Provides html escaping to avoid accidental or malicious injection of text that might interfere with the html context where the text is inserted.

htmlAttr(attrValue, attrName [, attrUnits])
Returns a JSON string that contains a generated html attribute declaration. Any double quotation marks characters (") that are included in any of the `attrValue`, `attrName`, or `attrUnits` values are escaped (replaced) with `"` note that only double-quote characters are escaped (`&` is not escaped) so that you do not have to worry about accidentally double escaping if an already escaped string is passed in.

Example

```
htmlAttr( 5, "id" )
```
returns: id="5"

cssDecl(attrValue, attrName [, attrUnits])
Returns a JSON string that contains a generated css declaration.

```
cssDecl( 100, "height","px" )
```
returns height:100px;

Template Parser Test tool

The Template Parser Test tool is provided to help develop and test templates.

The usage of this tool is as follows.

```
templateParserTest.exe  templateFileName [paramJsonFilename [envJsonFilename] ]
```

Used with a single argument, the name of a template file is expected. In this usage, the template that is provided is parsed and tested for validity. Only the template expressions inside {{ }} are checked. The static text is not checked. With this

usage, only the templateFileName that is passed on the command line is validated. Any other template files that may be invoked from within that template file are not validated.

Used with two arguments, the second parameter is a JSON file that represents the context input. In this usage, the JSON context input is rendered through the template to produce a result, and no environment inputs are available to the template. For replay templates, the result is presumably HTML or a subset thereof. This input can be a JSON object or a JSON array.

Used with three arguments, the third parameter is a JSON file that represents the environment input. In this usage, the JSON context input is rendered in the same manner as with two arguments and the environment inputs are available. This input must be a JSON object where each environment variable is represented as a JSON name-value pair.

When you use templateParserTest.exe, use caution when you use templates that reference sub templates. Sub template paths are relative to the execution directory of templateParserTest.exe, not relative to the templateFileName provided as input. For example, the expected usage is to copy the templateParserTest.exe utility into the directory containing the root template of the templates being tested.

Template customization for Native replay

You can customize Replay Server templates.

You can either:

- Modify the Replay Server templates that are shipped with IBM Tealeaf
- Create custom templates

Modifying the replay server templates that are shipped with IBM Tealeaf

IBM Tealeaf ships with Replay Server templates. These templates are placed in the ReplayServer\TLT directory when you install IBM Tealeaf. You can modify these templates to customize mobile device session replay.

Note: Editing the templates in ReplayServer\TLT as a way of customizing how JSON data is converted to HTML, has certain drawbacks. You will likely need to re-implement any changes you make to the templates when a new version of IBM Tealeaf is installed.

Consult IBM Tealeaf Professional Services if you are considering modifying the templates that are shipped with IBM Tealeaf. IBM Tealeaf Professional Services personnel have the expertise and tools for modifying Replay Server templates.

Creating your own templates to customize mobile device session replay

You can create custom templates for use with mobile device session replay.

Custom templates are useful if you make changes to the out-of-the-box mobile controls in iOS or Android that result in a subclass of that control that has a different visual appearance. In such a scenario, the replay of that control might not show your customization. By using a custom template, you can make the replay match your customization.

By creating your own templates, you can avoid having to re-implement template changes whenever a new version of IBM Tealeaf is installed.

To create custom templates:

1. Create a folder named **custom** under either the `ReplayServer\TLT\iOS` or `ReplayServer\TLT\Android` subdirectories.

   The templates shipped with IBM Tealeaf will look in the **custom** folder and use the contents if present.

2. There are four customization points you can utilize by placing content into the **custom** folder.

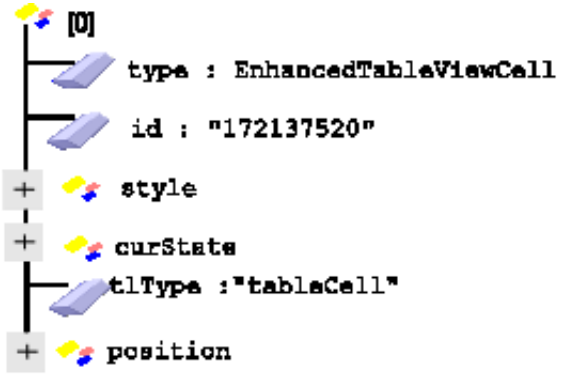
   Each customization point is a file that you can place in the **custom** folder.

   The four files are:

   nativeTypeRemap.json

   The `nativeTypeRemap.json` file is expected to contain a JSON object, where each key in the object is the name of a native iOS or Android type of control, and each corresponding value is the name of a template file that will handle the rendering of that native type.

   For example, assume that an iOS application developer has subclassed the `UITableViewCell` control to create `EnhancedTableViewCell` that utilizes custom drawing commands. In the logging framework (SDK), this might be displayed as follows:




```
control_label.tlt
   <label>{{[currState]["text"]}}</label>
```

Rendered Result

```
<label>Tealeaf</label>
```

Notice that the **tlType** is still the default `tableCell`, and by default, the rendering of this control is handled by the `control_tableCell.tlt` template. But also notice that the native **type** property shows `EnhancedTableViewCell`, which is the name of the subclass. You can use this name as a key in the `nativeTypeRemap.json` file and create a

template that customizes how the control type is rendered. For example:

Figure 16. Example of using custom templates - nativeTypeRemap.json

```
{
"EnhancedTableViewCell ": "control_EnhancedTableViewCell.tlt",
"ColorfulLabel": "control_ColorfulLabel.tlt"
}
```

In Figure 16, the templates look for a file `control_EnhancedTableViewCell.tlt` (also under the **custom** directory) and use that template instead of the default `control_tableCell.tlt` template to enable a customized rendering of `EnhancedTableViewCell` controls.

headAdditions1.tlt
If provided, the contents of the `headAdditions1.tlt` template is inserted in the `<HTML>` head element (after the CSS `<link>` elements, but before the in-line CSS).

Use this template to include any additional CSS file that are required to handle your customization.

headAdditions2.tlt
If provided, the contents of this template is inserted at the very end of the `<HTML>` head element.

This provides an opportunity to insert any scripts or to override any CSS inline in the HTML document.

bodyAttrs.tlt
If provided, this template specifies attributes to be added to the HTML `<body>` element.

You might use this template, for example, to add a style attribute and set a background-image to the reply of your application.

Troubleshooting

For more information on troubleshooting, see "Troubleshooting - Replay Server" in the *IBM Tealeaf Troubleshooting Guide*.

Managing POST Data Matching Plugins

Session data captured by Tealeaf is composed of the requests submitted by the visitor's browser to a web application and the responses served by the web server. These messages are usually in the form of HTTP GET requests or HTTP POST requests to the server and the response returned to the requestor. Historically, the request data in the POST requests has been in `name=value` pairs and is URL-encoded; the POST data resembles a URL query string.

- This type of data is also referred to as **form data** and is by far the most common mechanism for submitting HTML forms.

With the emergence of rich internet applications, requests and responses have become more complicated, using a wider range of optional technologies. In addition to the form data, rich internet applications are now using hierarchical forms of data, such as XML and JSON, and even binary forms to communicate between client and server.

- RIAs can also make use of plugin platforms. Such applications have the option to use proprietary data formats offered by the respective plugin vendors.

These data forms can be captured by the IBM Tealeaf CX Passive Capture Application and forwarded into the Tealeaf system. During replay, the IBM Tealeaf CX RealiTea Viewer and Browser-Based Replay clients need to know how to manage these data forms. In particular, for a given request happening at replay time, the captured request/response pair with which to associate the request may not be immediately identifiable.

For example, some requests may include a timestamp or a client-generated GUID parameter. The timestamp (or GUID) that is stored in a Tealeaf session corresponds to the time when the session was captured. During replay, a different timestamp (or GUID) corresponding to the time of the replay is generated as part of the request, which results in a replay request that does not exactly match any captured request.

Depending on the data format in use, this variable parameter could also be in the form of a name/value pair, such as `timestamp=14325453`, or an XML node, such as the following:

```
<timestamp>14325453</timestamp>
```

JSON properties may also be used:

```
{"timestamp": 14325453}
```

Ignoring a specific subset of variables in order to get the best matching request requires detailed knowledge about the underlying data format in which the content is represented.

Through the POST Data Matching Plugin framework, the RTV and BBR clients can access a set of plugins that help to identify the appropriate response with which to match the request. Using the content type indicated in the request, the replay client can locate the appropriate plugin to use to match requests of these content types to their responses in the session.

As the area of rich internet applications continues to expand, new plugin types can be developed and deployed to your Tealeaf environment, enabling Tealeaf replay to keep pace with emerging technologies.

- Additionally, users can configure priorities for applying the plugins, so that hybrid technologies can be managed by a suite of plugins. See “Plugin Affinity” on page 104.

This section provides overview information for how to manage plugins for RTV and BBR, which utilizes the plugins maintained on the Replay Server.

Note: For custom or hybrid formats, it is possible to build plugins for use in your Tealeaf environment. See “Building Custom Plugins” on page 107.

Overview

Supported Replay Clients

POST Data Matching plugins can be deployed without modification to RTV and BBR on Release 8.3 or later.

Note: Versions of RTV or BBR prior to Release 8.3 do not recognize plugins.

IBM TealeafCX RealiTea Viewer is a desktop application that must be installed on individual Windows desktops. See "RealiTea Viewer (RTV) User Manual" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Browser-Based Replay is a browser-based method of replay that is accessible through the Tealeaf Portal. No additional installation is required.

- See "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual*.
- Sessions served through Browser-Based Replay are managed, rendered, and delivered by the Replay Server, on which the plugins are installed. See "Configuring the Replay Server" on page 69.

Default Plugins

Tealeaf provides a set of POST Data Matching plugins for the following content types.

Table 3. Default Plugins

Plugin Name	Supported Content Types	DLL
Form Data	`application/x-www-form-urlencoded`	`TLReplayPluginForm.dll`
JSON	• `text/json` • `text/x-json` • `application/json` **Note:** For JSON transactions, `application/json` is the IANA standard MIME type and is recommended by Tealeaf for application use. **Note:** Available in Release 8.4 and later. • `application/x-json`	`TLReplayPluginJSON.dll`
`formdata/jsonp`	`text/html`	`TLReplayPluginJSONP.dll`
XML	• `application/msbin1` • `text/xml`	`TLReplayPluginXML.dll`
Google Web Toolkit	`text/x-gwt-rpc`	`TLReplayPluginGWT.dll`

To perform accurate POST data matching during replay, no additional installation is required for the above formats.

- Plugins are deployed as `.DLL` files to the RTV and Replay Server locations. See "Adding and Removing Plugins."

Adding and Removing Plugins

As needed, plugins can be added and removed from the replay clients to support accurate replay of your web applications. This operation can be viewed as a configuration step and does not require full re-installation of RTV or the Replay Server.

RTV

For IBM Tealeaf CX RealiTea Viewer users, plug-ins are enabled and disabled through the Plug-ins Options tab.

Note: Plug-ins must be provided to individual RTV users for deploying and enabling through the application.

For more information on managing plug-ins through RTV, see "RealiTea Viewer - Plug-ins Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Replay Server and BBR

When the Replay Server is started, a discovery is performed on the Tealeaf install directory on the Replay Server for the plug-ins, which are stored as `DLL` files.

During the render phase for a session, the Replay Server utilizes these `DLL` files to perform POST data matching of responses to requests before delivering the session data to the BBR client. The POST data matching plug-in framework is transparent for BBR end users.

Note: New plug-ins in BBR must be installed in the root Tealeaf directory of the Replay Server. To disable them, you simply remove them from the directory. If you do not have access to the Replay Server, these items can be inserted using the Put File option through TMS. See "TMS Advanced Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Updating Replay Profiles for DWR POST Data Matching

If you have upgraded to Release 8.4 or later, you must manually configure the FormData matching plug-in to recognize DWR POSTs and to apply the proper plug-in to match the content.

- **BBR:** This configuration is applied through the Replay Server Profile. See “Configuring the Replay Server” on page 69.
- **RTV:** Individual users of RTV must apply this change to their local profiles. See "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*.

  Note: This configuration information is not shared between RTV and BBR (Replay Server) profiles, so changes must be applied on each Replay Server and each instance of RTV.

Configuration

Note: For purposes of configuration, Tealeaf recommends using the IBM Tealeaf CX RealiTea Viewer client to perform configuration and to test plugin operations.

To install IBM TealeafCX RealiTea Viewer:

1. Install RTV on your local Windows system. See "RealiTea Viewer (RTV) User Manual" in the *IBM Tealeaf RealiTea Viewer User Manual*.
2. Verify that the appropriate plugins are available in RTV. See "RealiTea Viewer - Plugins Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.
3. Configure the IBM Tealeaf CX Passive Capture Application to capture the content types that are managed by the installed plugins. See “Configuring PCA to Capture New Content Types” on page 104.
4. Verify that you can search for and retrieve sessions that use the plugins you wish to test. See "RealiTea Viewer - Session Search and Subsearch" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Configuring PCA to Capture New Content Types

By default, the PCA captures content types used by most standard web applications. For rich internet applications, the PCA typically must be configured to allow the content types in use for your web application.

1. In RTV, select **Tools** > **Options?**.
2. Click the Plugins tab.
3. For each listed plugin:
   a. Select the plugin.
   b. Click **Properties**.
   c. Copy the entire string. Paste it into a text file for safekeeping.
   d. Repeat the above for each listed plugin.
4. Verify that the PCA is capturing each of the content types that you have listed in the text file.
   a. If the content type is not currently being captured, it must be inserted into the appropriate capture type list in the Pipeline tab of the PCA Web Console.

      Note: When you enable a new capture type, the PCA begins immediately capturing the content. Depending on the volume of content, the new capture stream can affect performance and processing throughout the Tealeaf system.
   b. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

Plugin Affinity

Through the Plugins tab in RTV, you can define the affinity value of each plugin. Since it is possible to deploy multiple POST data matching plugins for a single content type, you can configure the **affinity** value for each plugin to indicate the priority and, hence, the order in which the plugins are used.

Multiple plugins might be used when one plugin is required to handle a specific URL or area of the site, with the other plugin being the default plugin for the content type elsewhere on the site.

Affinity values range from `0.0` to `1.0`. Plugins with a greater affinity value are used for evaluating the same content type first. See "RealiTea Viewer - Plugins Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

When the Replay Rules are deployed to the Replay Server, the affinity values defined in RTV are applied to the BBR plugins. See “Deploying configuration to Replay Server” on page 105.

Verifying Plugin Operations

Location of content type: In hits captured by Tealeaf, the content type value is inserted into the `[env]` section of the request. In the example below, the content type is set to `text/xml`:

```
[env]
HTTP_CONTENT_TYPE=text/xml
```

When this value matches the value inserted for the plugin content type, the associated plugin is used for matching purposes.

Searching for sessions by content type: After you have enabled capture of the appropriate content types and waited a sufficient period of time for Tealeaf to capture sessions using this type, you can perform the following steps to locate a session in which the content type appears.

The basic method for locating these sessions is to specify a search using URLs to pages that use this content type.

Note: If you are unaware of the appropriate URL to use, you should contact your web development team. You may also contact Tealeaf Professional Services for assistance.

See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.

Verifying the plugin:
To verify the plugin is working, please complete the following steps.

1. Load a session using the content type into RTV.
   - You can load from the Portal session list. See "Search Results - Session List" in the *IBM Tealeaf cxImpact User Manual*.
2. In the toolbar, click the Request button.
3. Step through the requests of the session until you locate the appropriate entry in the `[env]` section of the request:

   ```
   HTTP_CONTENT_TYPE=text/xml
   ```

   where `text/xml` is replaced by the content type that you are testing.
4. From the RTV menu, select **View** > **Page Load Details...**.
5. In the Page Load Details column, scan the Method column. Look for a value that includes parentheses. For example:

   ```
   Post(244)
   ```
6. Page objects such as the above indicate that the POST data was matched. Right-click the object and select the **PostData** option.
7. You can review the contents of the sub-menu to identify the data that was matched.
   - If the sub-menu is empty, no data was matched for the POST.
   - See "RealiTea Viewer - Page Load Details" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Note: For more information on verifying the plugin, please contact Tealeaf Professional Services.

Deploying configuration to Replay Server:

Note: Before you enable POST Data Matching plugins to BBR through Replay Server, the plugin `DLL` files must be installed on the Replay Server. See “Replay Server and BBR” on page 103.

After you have installed the `DLL` files on the Replay Server, you can use the following steps to apply the plugin configuration from your installation of RTV to the Replay Server, which provides these configuration options to each BBR user in the environment.

Note: The following steps deploy **all** replay rules in your RTV configuration to the Replay Server. You should create a copy of your replay rules file and modify it to remove any personal replay rules that you want deployed before deploying the copy to Replay Server.

1. From the RTV menu, select **Tools** > **Options...**.
2. Click the Profiles tab.
3. To modify your profile rules for plugins, click **Edit Raw Profile...**.
4. At the top of the file are the listed plugins currently installed in RTV:

```
<Plugins>
    <ReplayHitMatchPlugin name="AMF" version="8.3.0.8326" interfaceVersion="1"
          errorCode="0" errorMessage="">
        <HitType contentType="application/x-amf" handlesQueryString="false"
                wantResponseData="false" haveCustomOptionsDialog="false"
                haveCustomIgnoreParamDialog="false"
                haveCustomResponseDisplay="false"
                haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
    </ReplayHitMatchPlugin>
    <ReplayHitMatchPlugin name="FormData" version="8.3.0.8326"
          interfaceVersion="1" errorCode="0" errorMessage="">
        <HitType contentType="application/x-www-form-urlencoded"
                handlesQueryString="true" wantResponseData="false"
                haveCustomOptionsDialog="false"
                haveCustomIgnoreParamDialog="false"
                haveCustomResponseDisplay="false"
                haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
    </ReplayHitMatchPlugin>
    <ReplayHitMatchPlugin name="FormDataCustom" version="8.3.0.8326"
          interfaceVersion="1" errorCode="0" errorMessage="">
        <HitType contentType="application/x-www-form-urlencoded"
                handlesQueryString="true" wantResponseData="true"
                haveCustomOptionsDialog="false"
                haveCustomIgnoreParamDialog="false"
                haveCustomResponseDisplay="false"
                 haveCustomPostDataDisplay="false" affinity="0.4">
            <URLFilter pattern="http://stuff.com/page1.asp" reqVar=""
                    reqVarValue=""/></HitType>
    </ReplayHitMatchPlugin>
    <ReplayHitMatchPlugin name="XML" version="8.3.0.8326" interfaceVersion="1"
          errorCode="0" errorMessage="">
        <HitType contentType="text/xml" handlesQueryString="false"
                wantResponseData="false" haveCustomOptionsDialog="false"
                haveCustomIgnoreParamDialog="false"
                haveCustomResponseDisplay="false"
                haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
        <HitType contentType="application/msbin1" handlesQueryString="false"
                wantResponseData="false" haveCustomOptionsDialog="false"
                haveCustomIgnoreParamDialog="false"
                haveCustomResponseDisplay="false"
                haveCustomPostDataDisplay="false" affinity="0.5">
            <URLFilter pattern="" reqVar="" reqVarValue=""/></HitType>
    </ReplayHitMatchPlugin>
</Plugins>
```

5. Make any modifications as necessary.
6. To save your changes, click **Save Changes & Exit**.
7. Enter the master Replay Server in the Default Profile textbox.
8. Click **Upload Settings to Server**.
9. Your replay profile has been applied to the Replay Server.

Building Custom Plugins

Plugins can be designed to:

1. perform decoding tasks of binary responses during replay (Base64)
2. perform data matching for the specified format (XML, JSON)
3. both (AMF, binary XML, JSONP)

POST data matching is a unique requirement for replay and isn?t needed in other areas of the Tealeaf product suite. The matching itself can range in complexity from simple to one involving complex rules, heuristics and response adaptation.

Note: Building POST Data Matching plugins requires a Professional Services engagement. For more information, please contact Tealeaf Professional Services.

Configuring the Search Server

Search Server implements several low-level functions used by the Tealeaf system to retrieve session data and to monitor the systems that maintain it. This section provides overview information on Search Server and instructions for configuring individual settings for Search Server.

Overview

Search Server Functions

The following functions are supported:

- **Retrieve Canister status** - Displays an XML version of Short Term Canister data points that can tell you the state of the current Short Term Canister.
- **Retrieve a replayable list of all active sessions** - Retrieves a list of all active sessions in the Short Term Canister with a link that enables them to be replayed. If IBM Tealeaf CX RealiTea Viewer is installed on the same machine, it can load all active sessions. For more information on RTV, see "RealiTea Viewer (RTV) User Manual" in the *IBM Tealeaf RealiTea Viewer User Manual*.
- **Perform session search** - Enables searching of the Short and Long Term Canisters. You can select the Canister to search, which allows you to search active or completed sessions or both types.
- **Retrieve Canister Events** - Enables retrieval of all configured Canister events from the machine on which Search Server is running.
- **Rebuild indexes** - If index files are corrupted, you can rebuild indexes using the check and fix command. This command pulls TLC files from the Canister and converts them to indexes.
- **Drain the Short Term Canister of sessions** - Search Server provides access to governor operations so you can drain the Canister, start spooling data, and more.
- **Retrieve event definitions** - The Search Server that is also the Event Master server can retrieve the event definitions from the database.
- **Distribution searches** - The Search Server hosted on the Portal Server distributes searches executed through the Portal interface to Search Servers located on other machines to retrieve sessions.

Search Server issues URL commands and returns sessions in XML format.

Search Server Hosts

Tealeaf Search Server can be co-located on the systems hosting the following Tealeaf components, or it can be hosted on a standalone server. Depending on the server where it is installed, its primary function may vary.

Tealeaf Component
Primary function of Search Server

Portal Server
The Search Server instance on the Portal is typically defined as the Event Master, which means that it is the designated server to retrieve event definitions from the database. These event definitions are cached on the server for retrieval as needed.

- The Portal's Search Server is also responsible for federating search queries to the Canisters where the requested sessions are located.

  Note: In a multi-server environment, the Portal Server does not contain Canister indexes. Some Search Server functions and settings do not apply.

Canister Server
The Search Server on an individual Canister is responsible for executing the searches submitted to it from other servers and returning the session information in XML format to the requestor.

IBM Tealeaf cxConnect for Data Analysis Server
The Search Server on a IBM Tealeaf cxConnect for Data Analysis Server manages the search queries executed as part of IBM Tealeaf cxConnect for Data Analysis tasks to retrieve sessions for extraction and saving into one of the supported formats.

IBM Tealeaf cxVerify Server
The Search Server on a IBM Tealeaf cxVerify Server manages the search queries executed as part of IBM Tealeaf cxVerify tasks to retrieve sessions for extraction and export.

Report Server
In some deployments, the Search Server that aggregates search results for Portal users is located on the Report Server to offload processing from the Portal Server. This deployment is not common.

Search Configuration

Using the Tealeaf Management System in the Portal, you can configure Search Server to suit your needs. For more information on using TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

To configure Search Server:

Note: Changes to the Search Server configuration require an IISReset, which forces all users from the Tealeaf Portal. Please perform these configuration changes accordingly.

1. Log into the Portal as an administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. Click the WorldView tab.
4. For the desired server, drill-down to the Search Server component.
5. Select **Search Server configuration**.
6. Click **View**.

7. In the Config Info dialog, click **Edit** to start Search Configuration.
   - To edit any individual setting, click the setting name. In the dialog, edit the value and click **OK**.
   - To change any group of settings, click **Modify**.

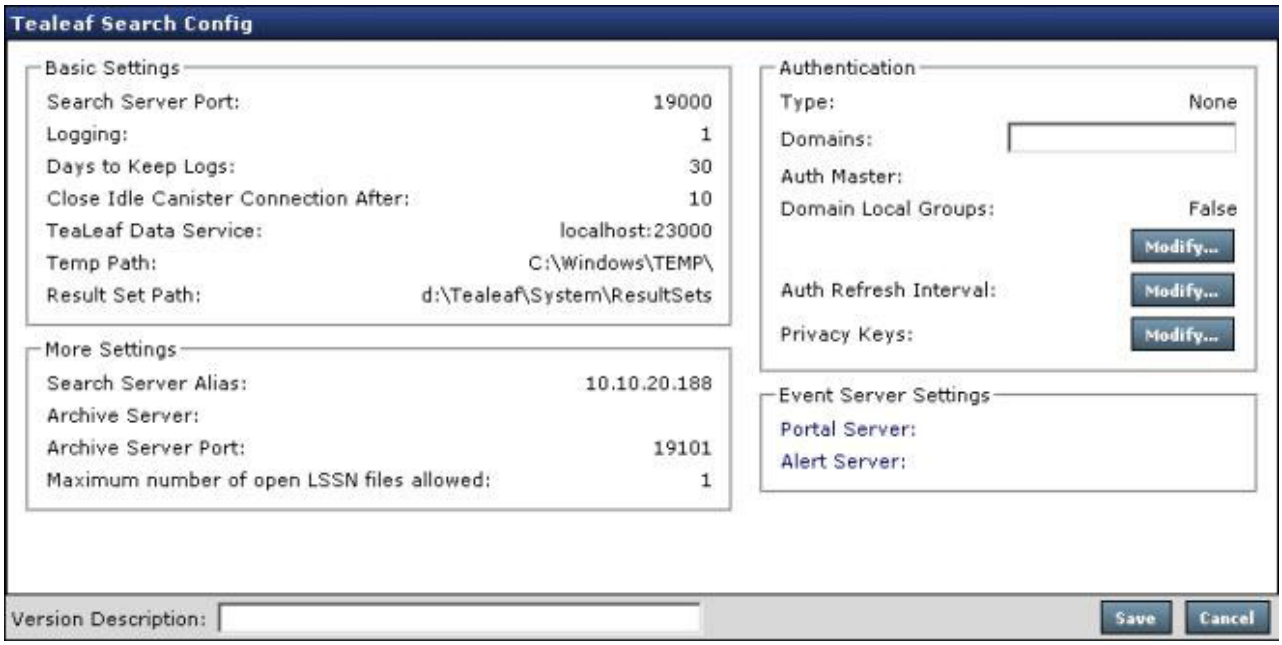


Figure 17. Search Configuration

Saving Search Server Configurations

Note: Do not push Search Server configurations to other Search Servers without considering all of the settings. Some Search Server settings, such as role definitions and TLI server locations, should not be applied across all servers.

Note: After you make changes to the Search Server configuration, the following steps are required:

- Push the configuration to any servers through TMS.
- Restart the Tealeaf Data Service. See "Configuring the Tealeaf Data Service" in the *IBM Tealeaf CX Configuration Manual*.
- Perform an IISreset of the Tealeaf Portal.

Basic Settings

Click any of the following options in this group to modify the value.

Setting Description

`Search Server Port`
Specifies the IP port for Search Server to use to query the Canister. The default value is `19000`.

`Logging`
Enable or disable logging. Search Server log files are saved to `TeaLeaf\Logs` on the machine on which the Search Server is installed.

`Days to Keep Logs`
Defines the number of days to retain Search Server log files.

Close Idle Canister Connection After
Specifies the number of minutes for Search Server to remain idle before closing its connection to the Canister. If the number of connections to the Canister exceeds 16, then the Canister disallows other components from connecting; it can be beneficial to have Search Server release its connection if no near-term future usage appears likely.

TeaLeaf Data Service
Hostname and port number for Search Server to connect to the Tealeaf Data Service. By default, this value is `localhost:23000`.

- Tealeaf Data Service manages connections between Tealeaf components and the databases they use. See "Configuring the Tealeaf Data Service" in the *IBM Tealeaf CX Configuration Manual*.

Temp Path
The fully qualified path on the Search Server machine where temporary files are to be stored.

Note: This path must be a fully qualified path value.

Result Set Path
The path on the Search Server machine where returned search results are stored.

Note: This path must be a fully qualified path value.

Authentication Settings

These settings allow you to set authentication properties that enable you to restrict access to Search Server and thus Tealeaf data.

- For more information on configuring authentication, see "Modifying authentication" on page 112.
  - For more information on authentication through NT, see "NT Authentication" on page 120.
  - For more information on authentication through the Portal, see "Portal Authentication" on page 126.
- For more information on the authorization refresh intervals, see "Modifying authorization refresh interval" on page 113.
- For more information on creating and modifying Portal privacy keys, see "Generating privacy keys" on page 116.

Through the Authentication panel, you can modify authentication mechanisms and the privacy keys that secure them.

Setting Description

Type The type of authentication method. See "Modifying authentication" on page 112.

Domains
The authentication domains in use. This field is populated by domains that you select. See "Domain local groups" on page 111.

Auth Master
The master server used for authentication.

Domain Local Groups
When enabled, local domain groups are used for authentication. By default, this value is `false`. See "Domain local groups" on page 111.

Auth Refresh Interval
The interval at which domain authorization is checked. See "Modifying authorization refresh interval" on page 113.

Privacy Keys
Click to create, edit, and delete the privacy keys in use by the Privacy Filter in the PCA and Search Server. See "Generating privacy keys" on page 116.

Domain local groups: When using NT authentication, Search Server can use domain local groups, instead of global domain groups. **Domain local groups** are groups local to the authentication master. You may deploy this option if access to the NT domain and its groups is not possible. This method enables you to deploy NT authentication without having access to the global domain groups.

- Search Server can use domain local groups.
- For more information from Microsoft on domain local groups, see http://support.microsoft.com/kb/884417.

Authentication master configuration:
On the authentication master, you must perform some server-side configuration. By convention, the authentication master is the same server where the Portal web application is installed. Please perform the following steps.

1. Login to the server that is identified as the Authentication Master in Search Server.
2. Open the Computer Management console:
   `Start > Administrative Tools > Computer Management`
3. Select the following from the Computer Management console:
   `Computer Management > System Tools > Local Users and Groups > Groups`
4. Right-click **Groups** and select **New Group**. Provide the group a meaningful name. For example: `TLusers`.
5. Add users to the domain group.

   Note: Users must be added by domain. For example, users in the `tealeaf` domain must be added as `tealeaf\username`.
6. Add users and groups until all Tealeaf users have been added to the local domain.
   - You should create at least two groups, one for users and one for administrators.
7. In Tealeaf Search Server configuration, click **Modify...** beneath Domain Local Groups.
8. Enter the local machine name in the Domains textbox. Do not use `localhost`.
9. Click the Domain Local Groups checkbox.
10. You can now add users to user groups and admin groups.
11. Click **Add to User Groups...**.
12. Search Server configuration lists the groups defined on the local machine, instead of the domain server.

    Note: Users that are added to the listed groups must be part of the local domain. They cannot be user accounts for the local machine.
13. Repeat the above steps for admin groups.
14. Complete the rest of the configuration for NT authentication.
    - See "NT Authentication" on page 120.

Modifying authentication:
To modify Search Server authentication:

1. To configure authentication, click **Modify...** in the Authentication area of the main Search Configuration dialog.
2. The following options are available for modification:

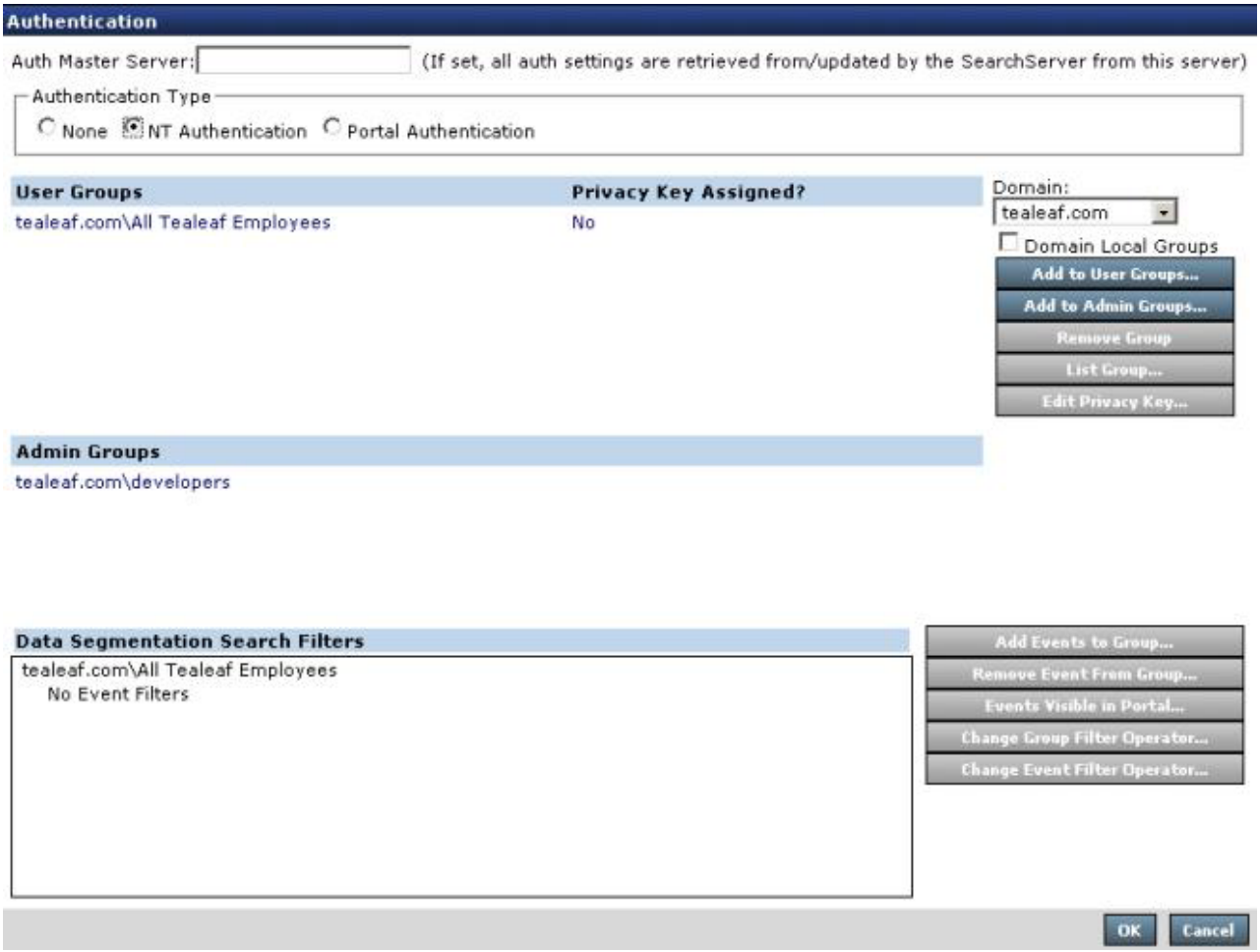


Figure 18. Search Configuration options

Setting the `Authentication Type` allows you to specify the type of authentication to use; for example, "NT Authentication" on page 120 or "Portal Authentication" on page 126, or to disable authentication `None`.

User and Admin Groups: You can define the authentication server from which to retrieve user and administrator groups used by Search Server.

Setting Description

`Domain` By specifying an NT authentication domain, Search Server automatically locates the domain controller on the network. This menu is populated automatically. After you specify the domain, you can add groups to the Admin or User categories.

- To add a new domain, select **Enter domain...** from the drop-down.

`Domain Local Groups`
When enabled, local domain groups are used for authentication. By default, this value is `false`.

Add To User Groups
Groups assigned to the user category have restricted access to IBM Tealeaf CX RealiTea Viewer and Search Server. In the data segmentation section, you can specify a search phrase that is ANDed to every search request the Search Server makes. Groups are listed in the format `domain\group`.

Add to Admin Groups
Groups assigned to the Admin category have unlimited access to IBM Tealeaf CX RealiTea Viewer and Search Server commands and features. Admin members can access indexes, set up shared IBM Tealeaf CX RealiTea Viewer profiles, and perform Search Server commands.

Remove Group
Removes a selected group from the user or admin list.

List Group
Lists all usernames belonging to a group on the NT domain.

Edit Privacy Key
Edit the privacy key for the selected user. See "Generating privacy keys" on page 116.

Data Segmentation Search Filters: These filters restrict access to Tealeaf data by user group. Data segmentation is performed by ANDing a specific event onto every request made through the Search Server by a member of the user group.

- When a user or admin group is added using the Add To commands, the group name is displayed in this window along with the events that define the sessions that the group may access.
- See "Data Segmentation" on page 128.

Setting Description

Add Events to Group
Specifies the events that will be ANDed to the search request of the users. One way to create a data-restricted event is to fire an event on a particular URL. For example, you can segment data by firing an event on `www.usa.mycompany.com` and on `www.uk.mycompany.com`. These two events could be used to define two data segmentation groups.

Remove Event from Group
Removes the selected event from the group.

Events Visible in Portal
A list of the currently configured events that can be made visible in the Portal to users in each group.

Change Group Filter Operator
When you have more than one event configured for a given group, use this command to either AND the events together or OR them together.

Change Event Filter Operator
When you have more than one event filter configured for a given group, use this command to either AND the filters together or OR them together.

Modifying authorization refresh interval: This setting controls how often a main, slave, or Archive Search Server asks the domain server for the list of users belonging to any groups set up for NT Authorization. To change the refresh interval, click **Modify** next to `Auth Refresh Interval` in the Tealeaf Search Config dialog.

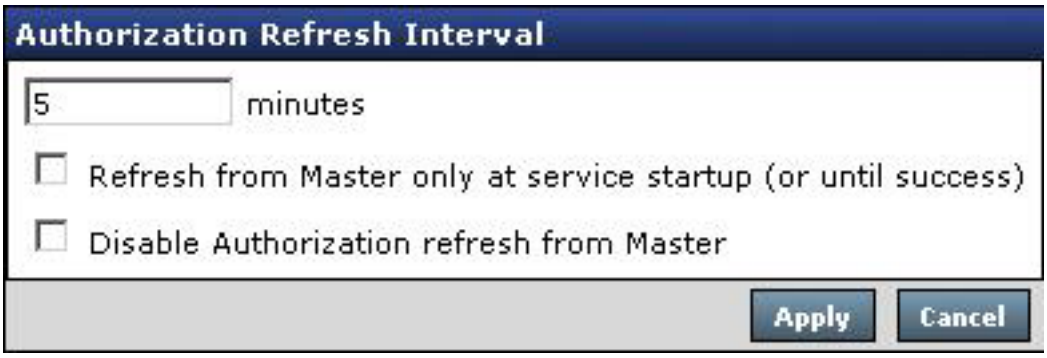


Figure 19. Authentication Refresh Interval options

Setting Description

`Update every n minutes`
Perform an authorization refresh update at the specified interval. Default value is 5 minutes.

`Refresh from Master at service startup`
Update only on startup or until the Master responds successfully. Retries are attempted every `n` minutes, as defined in the above setting.

`Disable Authorization refresh from Master`
Never update authorization.

Configuring on-demand privacy: Privacy rules can be applied to sessions requested through Search Server by the IBM Tealeaf CX RealiTea Viewer application or the Replay Server, on behalf of Browser Based Replay users. These rules are applied based upon the group membership of the requesting user.

- For more information on configuring on-demand privacy, see "On-Demand Privacy" on page 133.

More Settings

These settings allow you to specify the Search Server alias and other properties.

Setting Description

`Search Server Alias`
This setting is used when your enterprise is unable to access the server unless its name is further qualified with a domain name. For example, the server's name is `server1` but it can be seen on the network only as `server1.mydomain.com`.

Note: If your enterprise's network does not recognize short server names, then you must populate this field with the long server name, or searches that use this Search Server may not return results.

`Archive Server`
This setting tells a Search Server where its Archives are located. When this value is set and you connect to indexes from IBM Tealeaf CX RealiTea Viewer, it automatically finds the Archived indexes, instead of requiring manual configuration. It is not necessary to add port 19100 to this setting; IBM Tealeaf CX RealiTea Viewer adds it when it looks for the Archives.

- This setting needs to be configured only if you have licensed and installed IBM Tealeaf cxVerify. See "cxVerify Administration Manual" in the *IBM Tealeaf cxVerify Administration Manual*.

Archive Server Port

The port through which Search Server communicates with the Archive Server defined above.

- This value is inserted into the `.xml` for the segment, when it is moved from the Processing Server to the Archive Server. At a later point, Tealeaf components that use this `.xml`, such as RTV, use this value to know where to acquire the data.
- This setting needs to be configured only if you have licensed and installed IBM Tealeaf cxVerify. See "cxVerify Administration Manual" in the *IBM Tealeaf cxVerify Administration Manual*.

Maximum number of open LSSN files allowed

This value defines the maximum number of canister files that are allowed to be open at one time. The default value is 1.

Note: Do not configure this setting to a value other than 1 without contacting Tealeaf Customer Support.

Event Server Settings

Setting Description

Portal Server

On each Processing Server, this setting is used by a number of Tealeaf components, including RTV, to contact the Portal?s Search Server.

- If needed, the Portal Server setting can be specified as an IP address, hostname, or alias.

  Note: Whether you are specifying the Portal Server with an IP address or an alias, you should use consistent references in RTV, the Portal Management page in the Portal, and the Search Server configuration for each Processing Server.

  – For more information on configuring the Portal Server in the Portal Management page, see "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

  – For more information on configuring access in RTV, see "RealiTea Viewer - Advanced Options Tabs" in the *IBM Tealeaf RealiTea Viewer User Manual*.

  Note: If the Portal Server and Reporting Server are installed on separate machines, in the Search Server configuration the Portal Server field should be set to the name of the Reporting Server for all Canisters. On the Portal Server and Reporting Server themselves, leave this field blank.

Alert Server

Specifies the server that hosts the Tealeaf Alert Service.

- If this value is not specified, then the Portal Server location is used.

Privacy Keys

Privacy keys are used for encryption and decryption by the Privacy Filter, which is available in the IBM Tealeaf CX Passive Capture Application and in the Windows pipeline as a session agent.

- For more information on PCA privacy, see "PCA Web Console - Rules Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
- For more information on pipeline privacy, see “Extended Privacy Session Agent” on page 261.

- For more information on pipeline rules creation, see “Privacy Session Agent” on page 291.
- For a general overview of how Tealeaf manages privacy, see "Managing Data Privacy in Tealeaf CX" in the *IBM Tealeaf CX Installation Manual*.

These keys are managed by Search Server and are automatically retrieved during session replay as needed for decryption.

Generating privacy keys:
Privacy keys can be generated through the Search Server configuration in TMS.

Note: Any encryption key used by the PCA to encrypt and by Search Server to decrypt must be defined in Search Server configuration and provided to the PCA. For more information on defining these keys, see "PCA Web Console - Rules Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

1. Log into the Portal as an administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. Click the WorldView tab.
4. For the desired server, drill-down to the Search Server component.
5. Select **Search Server configuration**.
6. Click **View**.
7. In the Config Info dialog, click **Edit** to start Search Configuration. The following dialog is displayed:

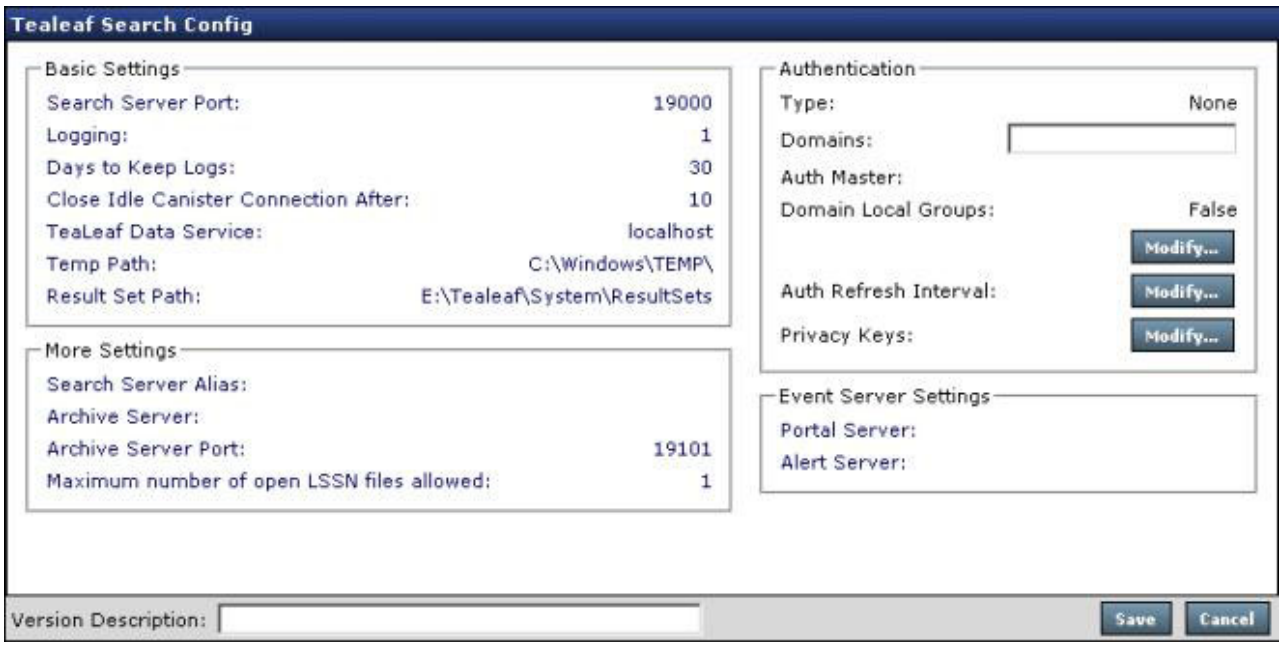


Figure 20. Search Configuration in TMS

8. Click the first **Modify** button in the Authentication section. The following dialog is presented:

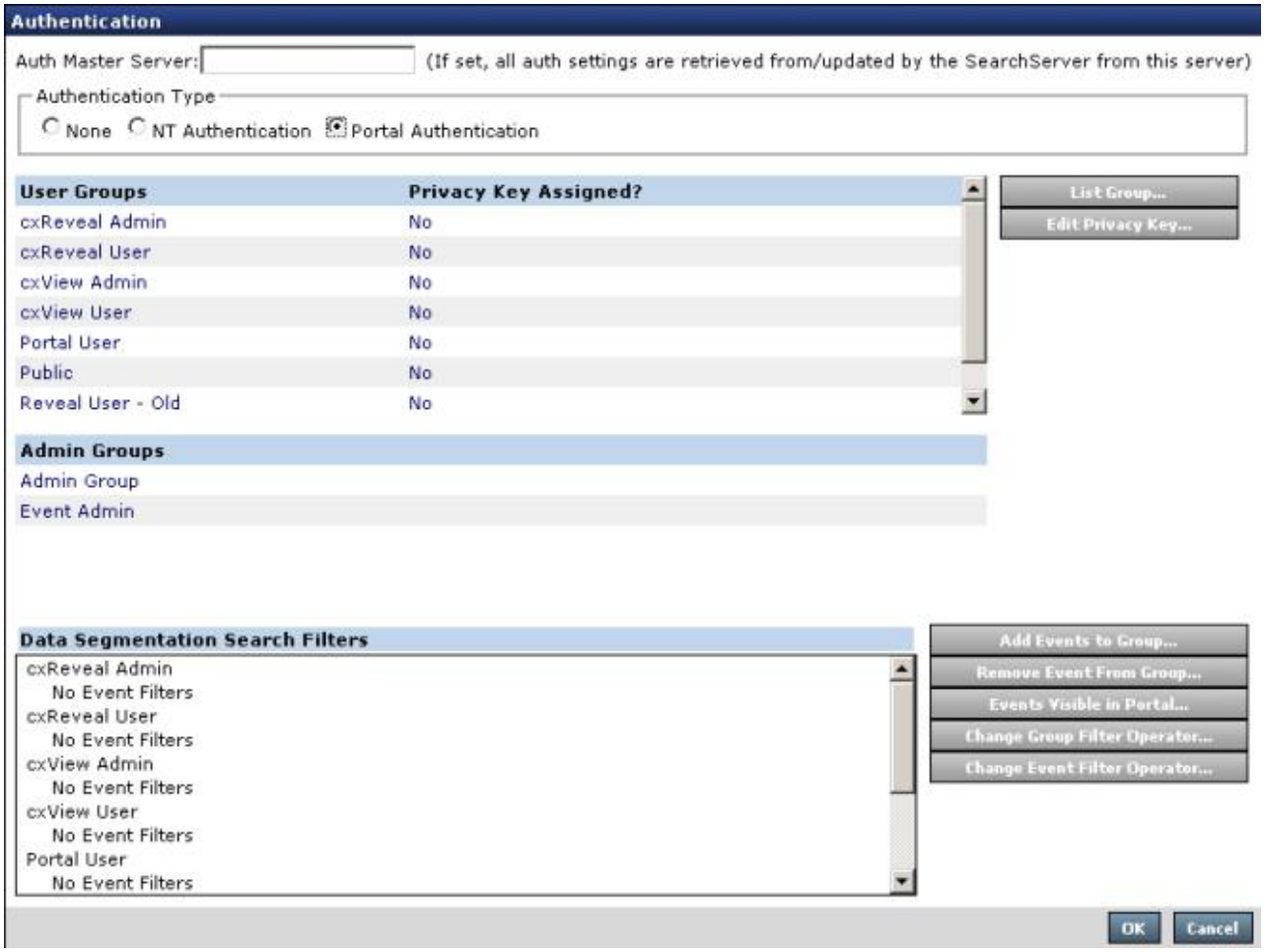


Figure 21. Authentication configuration showing Portal Authentication options

Note: You must have either NT Authentication or Portal Authentication enabled to get to the privacy key options.

9. If you don't see groups listed under **User Groups**, you can add them.
10. After you have one or more user groups listed, you can assign privacy keys.

Creating Privacy Keys:
To create/assign Privacy Keys:

Note: Only one privacy key can be assigned to a group. If multiple privacy keys are required, you must create a group for each key and assign users to the groups as needed.

1. Select a group in the User Groups listbox and click **Edit Privacy Key**. The following dialog is displayed:

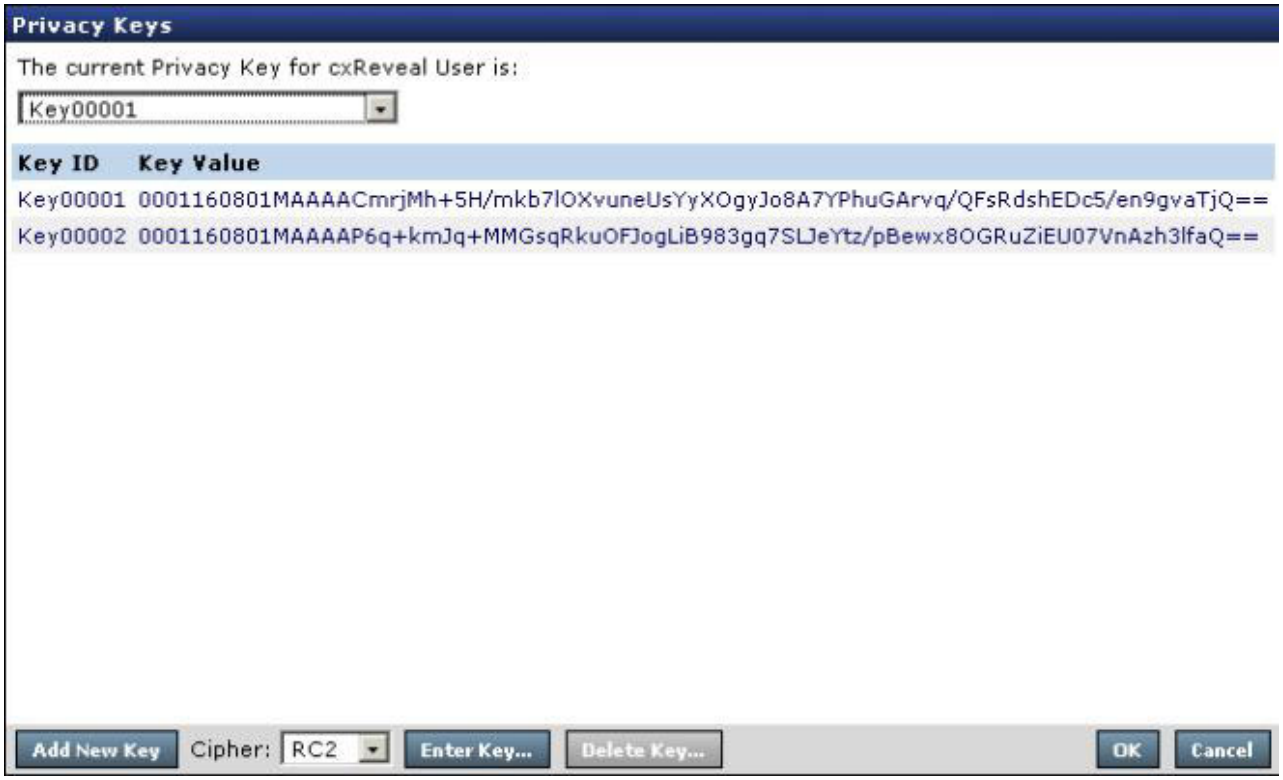


Figure 22. Privacy key configuration

2. Select the desired cipher from the dropdown. Click **Add New Key** to create a new key.
3. To assign it to the group, select the new key from the dropdown at the top of the dialog.
4. If you need to use a key ID and key value in the Privacy session agent configuration file, then copy them from the Privacy Key dialog at this time. You can use standard Windows keyboard shortcuts to copy the values from the fields and then paste them into `Privacy.cfg`.
   - For example, the above key ID and value should be pasted into the `[Keys]` section in the following format: `Key00001=<key_value>`.
5. When finished with the Privacy Key dialog, click **OK**. For the user group, you should now see **Yes** in the Privacy session agent Key Assigned? column.
6. Repeat this process for all groups for which data is encrypted.
7. When you are finished assigning privacy keys to groups, click **OK** to commit the changes.

Adding or deleting privacy keys (independent of authentication settings):
To create or delete privacy keys, click **Modify** next to the Privacy Keys setting in the Tealeaf Search Config dialog.

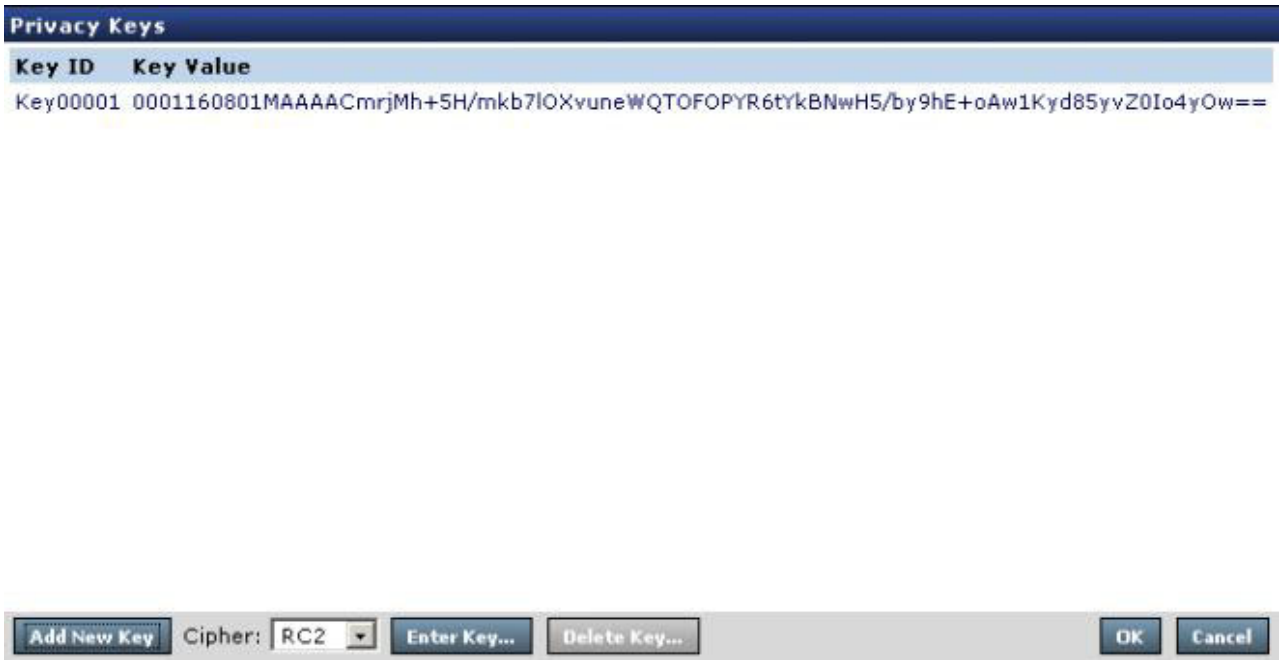


Figure 23. Privacy Keys dialog

The list of available privacy keys is displayed in the Privacy Keys dialog. You can create new privacy keys in this dialog without having to set up groups in the Authentication dialog first.

- To create a new privacy key, select the cipher to use from the drop-down. Then, click **Add Key**. A privacy key is generated and displayed.
- To remove a created privacy key, select the key and click **Delete Key**. The key is removed.

To manually create a privacy key, click **Enter Key**.

Figure 24. Entering Privacy Keys

To manually create a privacy key:

1. From the Cipher drop-down, select the method of encryption to use for the key.
2. Enter the unique privacy key identifier in the space provided.
3. Enter the privacy key value. To generate a unique ID, click **Generate New Key Value**.
4. To save the entered privacy key, click **OK**.

Note: When manually creating a privacy key it is important to use a valid value for the key. This value is an encrypted and encoded key value, along with key information and key name. Unless you are copying an existing key value from an external source you should use Generate New Key Value to create a valid key value. If you change the key name after generating the key value, then you must generate a new key value, since the name is stored as part of it.

Authentication

Search Server authentication lets you define a list of users that have administrative or general user privileges to perform operations such as searching and retrieving session data, editing events, or modifying system settings.

When authentication is configured for Search Server, visitor requests automatically present the Windows domain and username of the currently logged-in account. The login information is checked to determine the following:

- Whether the user exists on the domain specified
- Whether the user actually belongs to the group specified and has restricted access based on the group. This group defines the types of tasks the user can perform in the client. For example, a user who is a member of the Tealeaf user's group may be able to search and not to configure events.

If the user belongs to none of the groups, access is completely denied.

NT Authentication

IBM Tealeaf CX is capable of using NT domain information to authenticate users and restrict access to specific functionality based on user identity. The two components of IBM Tealeaf CX that can be configured to use NT authentication are the Portal and the Search Server service.

Note: Active Directory user login names should not included any accented characters.

Note: It is highly recommended that both of these components be configured to use NT authentication together. If the Search Server's NT authentication is enabled, then the Portal should have its NT authentication feature enabled as well, or Portal users cannot search for or retrieve session data.

NT authentication relies on querying a Windows NT domain controller to determine existence of users and their NT user group memberships.

Note: It is recommended that two NT groups be specifically created on the domain controller for use as Tealeaf User and Tealeaf Administrator groups, although it is possible to use existing NT groups for these purposes.

- For more background information, see "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.
- For more information on configuring NT authentication for Search Server, see “Configuring NT Authentication for Search Server” on page 121.
- For more information on configuring NT authentication for the Portal, see “Configuring NT Authentication for the Portal” on page 122.

Configuring Active Directory:
To enable NT authentication use by Tealeaf, please verify and complete the following configuration steps in Active Directory.

1. In Active Directory, create two global security groups, one each for users and administrators. For example:
   a. `TLuser` - user group
   b. `TLadmin` - admin group
2. Assign Tealeaf users to these groups.
3. Tealeaf administrators must be permitted to create events in Tealeaf. Access is provided by enabling access to the Tealeaf Event Manager through the Portal menu.
   - See "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.
   - Search Server can be configured to use a Tealeaf event-based method for data segmentation. See Configuring the Search Server.
4. Verify that the Tealeaf Portal Server has permissions to query Active Directory for group information. For more information, please refer to your Active Directory documentation.
5. A service account must be created or used to run the Search Server service. You must create a new account within Active Directory if the local computer account does not have these rights or if multiple domains are involved.
6. Test accounts from both user groups by logging in to the Tealeaf Portal and executing a search.

Search Server NT authentication: Search Server authentication lets you define a list of users who have general or administrative privileges to perform operations such as searching for and retrieving session data, editing events, or modifying shared IBM Tealeaf CX RealiTea Viewer settings profiles.

When configured, clients of Search Server authenticate the currently logged in user before allowing access to Search Server's functions. The login information is checked to determine if the user belongs to the NT group specified and to restrict access based on the applicable group. For example, a user who is a member of the Search Server Users group only can search but cannot configure events.

If the user belongs to none of the groups defined in the Search Server authentication settings, access is denied to that user.

- In the case of the IBM Tealeaf CX RealiTea Viewer, a denied user cannot search for sessions or edit events.
- In the case of the Portal, a denied user cannot perform searches.

Configuring NT Authentication for Search Server:
To configure:

1. Verify that the Admin and User groups you want to use for the Search Server exist on the NT domain controller that you are using for authentication.
2. Edit the **Search Server configuration** using TMS in the Portal. To do this, select **TMS** from the **Tealeaf** menu. Make sure the **WorldView** tab is selected. Drill down to the **Search Server** component for the desired server, select "Search Server configuration" and then click on the **View** button. Then click **Edit** on the Config Info dialog to edit the configuration.
3. In the Authentication area of the Search Config window, click **Modify...**.
4. In the Authentication dialog, do the following:
   a. For Authentication Type, select the **NT Authentication** radio button.
   b. Select the NT domain to use from the Domains drop-down menu.

- To enter another domain, select **Enter Domain?**. In the dialog box, enter the domain identifier.

  Note: To specify a child domain, you may need to try both of the following forms:
  - `child.domain.com`
  - `child`

c. Click **Add to User Groups...**. Users who are members of the groups in the User Groups list may use Search Server features such as searching, getting session information, and retrieving sessions. Users who belong to only this group may not configure Canister events.
   1) The resulting Add Group dialog lists the groups defined on the domain controller for the chosen domain.
   2) Choose a group from the list and click **List Group...**. A list of members of that group is displayed.
   3) Click **OK** to add the group to the list of Search Server user groups. Repeat this step if needed.

d. Click **Add to Admin Groups...**. Only users who belong to this group may configure Canister events and upload shared Viewer profiles.
   1) The resulting Add Group dialog lists the groups defined on the domain controller for the chosen domain.
   2) Choose a group from the list and click **List Group...**. A list of members of the group is displayed.
   3) Click **OK** to add the group to the list of Search Server user groups. Repeat this step if needed.

e. Click **OK** to close the Authentication dialog.

5. Enter a description for the change to the configuration in the **Version Description** field at the bottom of the window and click **Save** to save the changes.
6. When prompted whether to add tasks to push the new version, click the **Yes** button. Also answer **Yes** when asked if you want to add restart tasks.
7. Enter a description in the Current Job pane, then click on the **Submit** button to submit the job to push the changed configuration and restart the Search Server.
8. Test the authentication by opening the IBM Tealeaf CX RealiTea Viewer and perform a search.
   a. If you are not a member of one of Search Server's User groups, you are denied access to searching.

      Note: If Search Server NT authentication is enabled and the Search Server service is running as a user that is not registered on the NT domain specified in SearchConfig (e.g., a member of one of the machine's local user groups), the service fails to start (it may return error code 110). Running the Search Server service under the Local System account is acceptable.

Configuring NT Authentication for the Portal:
To configure:

To enable this feature, you must turn on NT authentication for the Report database and modify IIS settings for the Portal virtual directory. See “Configuring the Report Server” on page 58.

To use NT authentication in the Portal, the machine on which the Portal is running must be a member of an NT domain. It should be in the same domain as the NT domain controller, or a trust relationship must be established between the domain controller's domain and the Portal server's domain.

Note: By default, the Portal creates an "internal" account for every valid NT user in the valid groups. See “Portal User Creation under NT Authentication.”

Enabling Portal NT Authentication:

1. Login to the Tealeaf Portal as an administrator.
2. Through the menu, select **Tealeaf** > **TMS**. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Open the Search Server node.
4. Click **Search Server configuration**.
5. In the Config Actions panel, click **View/Edit**.
6. The Search Server configuration is displayed.
7. Under Domain Local Groups, click **Modify...**.
8. In the Authentication dialog, select **NT Authentication** in the **Authentication Type** section.
9. For more information on configuring NT authentication, see “Modifying authentication” on page 112.

Disabling Portal NT Authentication:
To disable anonymous access in IIS virtual directory settings:

1. Open the Internet Information Services Manager from the Windows Start menu: **Start** > **Control Panel** > **Administrative Tools** > **IIS Manager**
2. Expand the machine node and right-click the Portal virtual directory under the website where it was installed (usually the Default Web Site). Select **Properties**.
3. Click the Directory Security tab, and then click **Edit** under Authentication and access control.
4. Deselect the **Anonymous access** checkbox and select the **Integrated Windows authentication** checkbox.
5. Close the dialog.
6. To restart the IIS Admin service, right-click the computer node in IIS Manager and selecting **Restart IIS...** from the menu. Anonymous login to the Portal is prohibited. Users must be logged in to the NT domain, and be using Internet Explorer to connect to the Portal, in order to be recognized.

Portal User Creation under NT Authentication: Depending on your configuration settings, the Portal can automatically create Portal user accounts for NT users when they first visit the Portal home page.

- Alternatively, you can create these accounts by mapping them manually. See “Manually mapping Portal users to NT users” on page 125.

Automated Portal user creation under NT authentication:
If desired, you can configure the Portal to automatically create Portal user accounts for NT users that arrive to the Portal login page. You can assign the Portal account to one product (IBM Tealeaf cxImpact, IBM Tealeaf cxView, or IBM Tealeaf cxReveal) and any groups within that product.

- Any other product assignments must be completed after the user is created.

Note: If you wish to auto-create users across multiple products, you might notify IBM Tealeaf cxImpact users to login Monday and IBM Tealeaf cxView users to login on Wednesday, making the necessary configuration changes between days.

1. After you have enabled NT authentication through Search Server, you must configure some settings in each of the product settings groups.
   - For more information on Search Server configuration, see "Enabling Portal NT Authentication" on page 123.
2. From the Portal menu, select **Tealeaf** > **Portal Management**.
3. **General User Creation Settings:**
   a. Click **IBM Tealeaf CX Settings** > **Users**.
   b. Configure the following settings to the listed values. For descriptive information on these settings, see "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

      Setting Value

      `Automatic NT User Login`
      `Enabled`

      `Automatic User Creation`
      `Enabled`

      `Automatic User Creation Settings Prompt`
      optional

      `Automatic User Creation Type`
      Set this value to the Tealeaf product to which you would initially like to assign users. `Portal` users are IBM Tealeaf cxImpact users.

      Note: For the product to which you are assigning newly created users, you must enable `Automatic User Creation`.

   c. **Password Security:** The following settings pertain to password length, security, and duration. If you have not done so already, please consult with your IT staff to determine requirements.
      - `Minimum Password Length`
      - `Previous Password History (Count)`
      - `Previous Password History (Days)`
      - `Require Strong Passwords`
      - Newly created users must create a new password that meets these guidelines. For descriptive information on these settings, see "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

   d. Click **Save**.
4. **IBM Tealeaf cxImpact User Settings:** If you chose `Portal` for `Automatic User Creation Type`, please complete the following configuration for new users automatically created by the Portal.
   a. In the same set of settings, configure the following settings to meet your requirements. For descriptive information on these settings, see "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.
      - `New User Default Group`
      - `New User Default Page`
      - `New User Default Time Zone`
      - `New User Group Default Language`

b. Click **Save**.

5. **IBM Tealeaf cxReveal User Settings:** If you chose `cxReveal` for `Automatic User Creation Type`, please complete the following configuration for new users automatically created by the Portal.
   a. In the Portal Management page, click **IBM Tealeaf cxReveal** > **Users**.
   b. Configure the following settings to meet your requirements. For descriptive information on these settings, see "cxReveal Settings" in the *IBM Tealeaf cxReveal Administration Manual*.
      - `Automatic User Creation` must be enabled.
      - `New User Default Page`
      - `New User Default Time Zone`
      - `User Default Group`
   c. You should review the Password-related settings as well.
   d. Click **Save**.
6. **IBM Tealeaf cxView User Settings:** If you chose `Portal` for `Automatic User Creation Type`, please complete the following configuration for new users automatically created by the Portal.
   a. In the Portal Management page, click **IBM Tealeaf cxView** > **Users**.
   b. Configure the following settings to meet your requirements. For descriptive information on these settings, see "cxView Settings" in the *IBM Tealeaf cxImpact Administration Manual*.
      - `Automatic User Creation` must be enabled.
      - `Automatic User Creation Settings Prompt`
      - `New User Default Page`
      - `New User Default Time Zone`
      - `User Default Group`
   c. You should review the Password-related settings as well.
   d. Click **Save**.

Manually mapping Portal users to NT users:
To map a Portal user to an NT user:

1. Log in to the Portal Web application as a Portal administrative user.
2. Click **Tealeaf** > **Portal Management**.
3. Click the user administration link for the type of user you wish to create:
   - **IBM Tealeaf cxImpact:** `CX User Administration`
   - **IBM Tealeaf cxView:** `cxView User Administration`
   - **IBM Tealeaf cxReveal:** `cxReveal User Administration`
4. Click **Users**. Click **New** in the toolbar.
5. Enter the Portal username if creating a new user. Enter the NT domain and NT username (exactly as typed by the user when logging into the NT domain) to which this Portal user maps.
6. Specify other user properties.

   Note: Only one Portal user account should be associated with each NT domain/user combination.
7. Click **Save**.
8. When the user whose account you just modified requests the Portal login page, their NT username is posted to the login page, and the user can access the Portal by clicking **Login**.

- See "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.
- See "cxView User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.
- See "cxReveal User Administration" in the *IBM Tealeaf cxReveal Administration Manual*.

HTTPS/SSL and NT Authentication:
If you are using NT Authentication and also turn on HTTPS/SSL on the Portal (in IIS's settings), you may not see the expected NT-authenticated login page for the Portal until the Portal machine is added to Internet Explorer's Trusted Intranet Zone.

Note: If you encounter the Portal error **The Tealeaf ASP Utility Object (TLAspUtil) could not be loaded**, and you have been recently added to the Tealeaf Users Active Directory group, then perform this procedure.

1. Go to **Start** > **Run**.
2. Type `cmd` in the Open: field.
3. Enter the following command:
   ```
   gpudate /force
   ```
4. Reboot the user's machine (It is important to reboot and not simply logoff.).

Portal Authentication

The Search Server can be configured to authenticate user access through the Tealeaf Portal's authentication mechanisms. Configuring portal authentication is similar to how you can configure NT authentication for Search Server with the following differences:

Note: Portal authentication extracts user and group information from the Portal database tables. You cannot make changes to users and groups through Search Server configuration. For more information on making changes to Portal users and groups, see "cxImpact Administration Manual" in the *IBM Tealeaf cxImpact Administration Manual*.

Note: Portal authentication can be enabled only on a server that contains the Portal user database. All other servers that host Search Server must point to the Portal authenticating server as their authentication master.

By default, Search Server assumes that the following Portal user groups have administration privileges:

- `admin group`
- `event admin`

For more background information, see "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

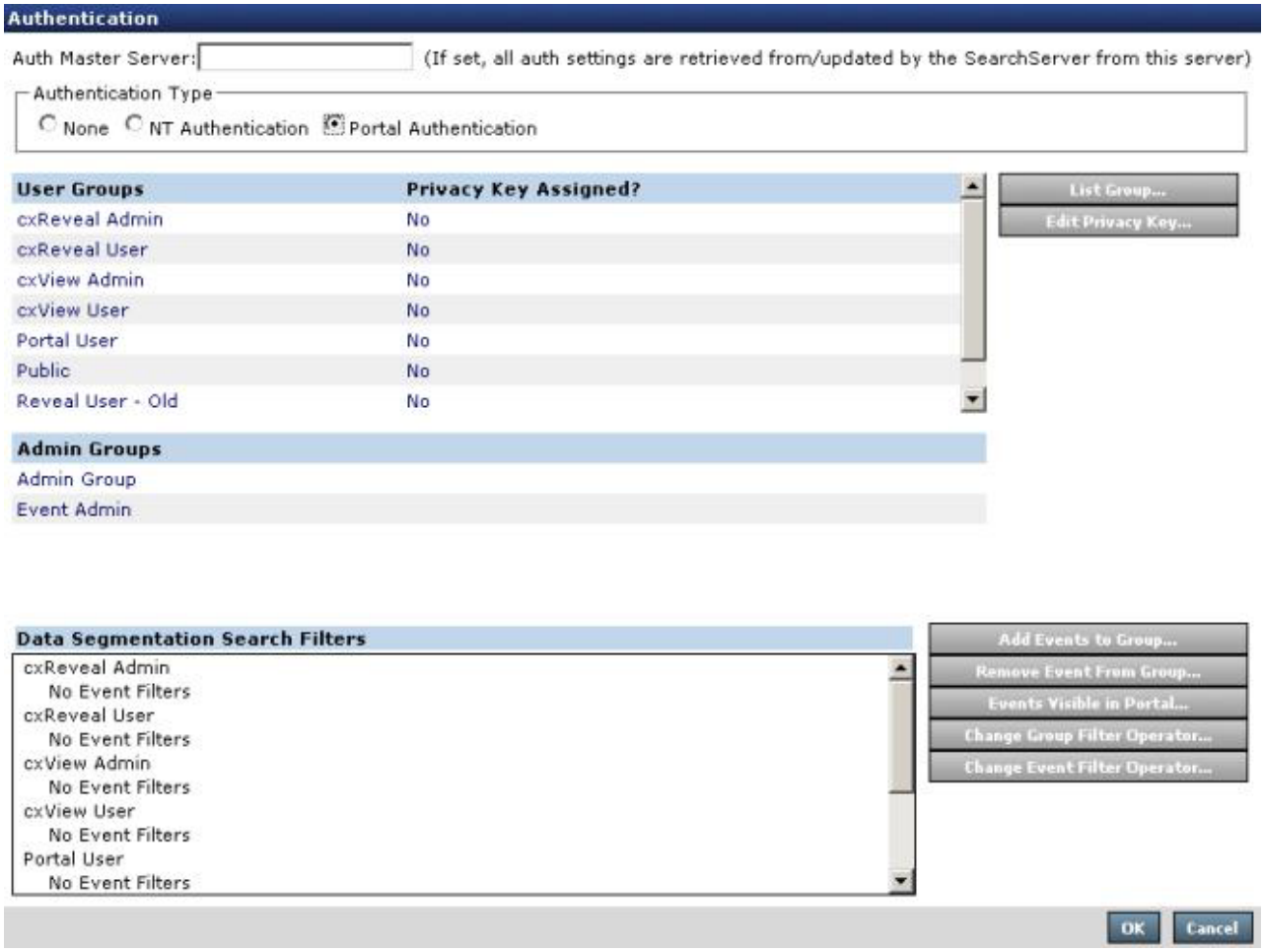


Figure 25. Configuring Portal Authentication

To view the members of a user or admin group, select the group and click **List Group**.

- For more information on the available buttons, see "Modifying authentication" on page 112.

Like NT authentication, Portal authentication supports the use of privacy keys and data segmentation.

- See "Generating privacy keys" on page 116.
- See "Data Segmentation Search Filters" on page 113.

Configuring Authentication Slaves

Note: If you have configured NT authentication or Portal authentication, the Search Server configurations of all authentication slave servers must be configured to point to the authentication master. Please verify the `Authentication Master` setting on each authentication slave server.

Debugging Search Server Authentication

For authorization, the Search Server uses the same user ID that issued the Event Maintenance command to read and update the slave Search Servers. If a slave Search Server rejects those commands, then it can be inferred that slave servers are running with a different authorization configuration.

Examining the Search Server logs generally identifies the problem. When Search Server restarts with authorization enabled, the list of defined users accessible to it are inserted into the log.

- Search Server is typically restarted at 1AM. At restart time, the Search Server log also lists OperatingParams, which indicate the authorization mode and other operating parameters.
- If you know the time that saving events failed, you can examine the slave server log at that time for the /NTYP command from Search Server to identify the user name it's using and then compare that ID to the user list from the last restart.

Data Segmentation

Data segmentation restricts the search data returned for a given user based on authentication group using Tealeaf events that you create.

Events that are configured for data segmentation are used to filter live sessions so that active sessions appearing in the Portal are visible only to users who have access to them. In addition, you can specify which events are visible to members of specified groups; users cannot see sessions from other groups, and active events appearing in the Portal pertaining to the other groups' sessions are hidden, too.

Note: To use data segmentation, your Tealeaf system must be configured to use Portal or NT authentication and authentication groups.

For every submitted search, the term is ANDed with a restricting term defined for the user's authentication group. The second search term that is appended to the user's search term is an event configured to fire on a specific type of session.

Data segmentation example 1: For example, suppose your enterprise supports two web sites, `www.example1.com` and `www.example2.com`. There are separate customer service groups to monitor each website, and neither group is supposed to see the session data from the other site.

To enable data segmentation, two separate events must be defined. One event fires when the request or response pertains to `www.example1.com`, while the other responds to `www.example2.com` data. The first event is assigned unique identifier `17`, and the second received unique ID `18`.

To enable data segmentation of these two websites:

- Through Search Server configuration, authentication is enabled.
- Two user groups are created: `Example1group` and `Example2group`.
- The appropriate users are added to each group.
- Through the Search Server configuration:
  1. Example1group is configured to use the following filter string:
     `(canisterappevent/uniqueid contains 17)`
  2. `Example2group` is configured to use the following filter string:
     `(canisterappevent/uniqueid contains 18)`
- When members of the `Example1group` do searches, they cannot see sessions from `www.example2.com` sessions. When `Example2group` members execute searches, they cannot `www.example1.com` sessions.

Each group added in Search Config can have multiple events associated with it. These events can be combined using the Boolean operators AND or OR.

- For users belonging to multiple groups, individual filters are OR'ed together before being joined with the requested search. For the above example, for each search term executed by a member of both groups, the following filter is applied to the term:

```
((canisterappevent/uniqueid contains 18) or
 (canisterappevent/uniqueid contains 17))
```

Data segmentation example 2: Another example: suppose you have configured the following three groups with events in Search Config:

Group Events

TeaLeaf\users
event 1

TeaLeaf\eng
(Items AND'ed together)
event 2
event 3

TeaLeaf\qa
(Items OR'ed together)
event 4
event 5
event 6

- A user who is a member of `TeaLeaf\users` searching for the word `session` generates the search query:
  `(canisterAppEvent contains 1) and (session)`
- A user who is a member of `TeaLeaf\eng` searching for the word `session` generates the search query:
  `(canisterAppEvent contains (2 and 3)) and (session)`
- A user who is a member of both `TeaLeaf\eng` and `TeaLeaf\qa` searching for the word `session` generates the search query:
  `(canisterAppEvent contains (2 and 3) or (4 or 5 or 6)) and (session)`

Data segmentation pre-requisites: Before you begin configuring event-based data segmentation, please verify that the following conditions are met:

- Users must be added to the appropriate groups.
- You must have Portal or NT authentication enabled on every machine where Search Server is running.
- You must have an admin user group assigned in order to configure authentication.
- You must point each server to the authentication master server to populate the same groups to each server in the environment. Having different groups on different servers causes varying results.
- You must have the Portal also configured for NT authentication.
- Proper data segmentation depends on a correctly configured event.
- You must set the value of Canister Server under "More Settings" on page 114 to the appropriate value, if you have all of the following conditions in your Tealeaf environment:
  - Data segmentation with Portal or NT authentication
  - The Portal Server is the authentication master

Configuring data segmentation: Data segmentation works in conjunction with the other components on the IBM Tealeaf CX system. For example, you should also set up profiles in IBM Tealeaf CX RealiTea Viewer to fully enable all the security features of these client programs.

1. Set up the events that will perform the Data Segmentation:
To properly set up data segmentation, you must create event definitions that effectively divide the data into the buckets that you want to isolate from other groups. Suppose your company has two competing subdivisions, such as `www.myaudio.com` and `www.myvideo.com`, and you don't want either division to see each other's data. You can configure event-based data segmentation using hostname events to segment the data.

1. Open the Tealeaf Event Manager. From the Portal menu, select **Configure** > **Event Manager**.
   - See "Tealeaf Event Manager" in the *IBM Tealeaf Event Manager Manual*.
2. Click the Hit Attributes tab. See "TEM Hit Attributes Tab" in the *IBM Tealeaf Event Manager Manual*.
3. Create a new hit attribute.
   a. Enter the hostname in the Start Tag field. For example: `www.myaudio.com`.
   b. Do not specify an End Tag. This configuration means that the hit attribute searches for the explicit Start Tag.
   c. Set the other properties as desired.

      Note: When configuring your event for data segmentation, avoid using a `NOT` operator. The underlying search engine must retrieve all possible values for the event and then apply the `NOT` to generate proper results, which can significantly impact overall Portal performance.
4. Create a new event. See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.
   a. Set Evaluate to `First Hit of Session`.
   b. For the Track value, select `First per Session`.
   c. For the Value Type, select `Text`.
   d. Set Searchable & Reportable to `true`.
   e. Click the Condition step. For the condition of the event, select the hit attribute you just created.
   f. Click the Value step. Click **Select Item to Record...**. Select the hit attribute you created.
   g. Do not configure any other attributes.
   h. Click **Save Draft**.
5. Commit changes for both new objects.

After the changes have been committed, sessions from either website can be segmented based on the hostname events.

2. Enable Authentication:

1. Login to the Tealeaf Portal.
2. In the Portal menu, select **Tealeaf** > **TMS**.
3. In Servers view, open the Search Server node.
4. Click **Search Server configuration**. Then, click **View/Edit**.
5. The Search Server configuration window opens.

6. In the Authentication area, click **Modify**.
7. The Authentication dialog controls which groups have user access and administration access to the Search Server and consequently the Canister.
8. To enable NT authentication, click the NT Authentication button. Additional options are displayed.
9. From the Domain drop-down, select the domain name for your network. The Search Server automatically derives the domain controller on which the groups are located from the domain name.
10. To add the User Groups to the list, click **Add to User Groups**.

    Note: User groups are limited to see only the data specified by the Admin group and cannot use the Search Server interface to interact with the IBM Tealeaf CX Server.
11. The Add Group dialog displays all the groups available on the network. To show all users belonging to a particular group, click **List Group**. Select a group and click **Add**.
12. To add the Admin Groups, click **Add to Admin Groups**.

    Note: Groups with administrative access can edit event definitions and see all the data on the IBM Tealeaf CX system.
13. Configure Authentication.

    Note: You must select at least one admin group when using Authentication. See "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.
14. Add the user groups and admin groups. You must assign an admin group to administer the event definitions and perform other administrative tasks, like setting up profiles in RTV.

3. Add Events to the Authentication Groups:
To complete the configuration of data segmentation, you must add the events to the authentication groups. This step filters the data according to the group that examines the data. The Short Term Canister and Long Term archive are filtered. For example, when a member of the audio group views sessions in either the Portal or the IBM Tealeaf CX RealiTea Viewer, only the sessions from `www.audio.com` are displayed.

Data segmentation is entirely event-based. Each group added in Search Server Configuration can have multiple events, which can be combined using the Boolean operators AND or OR. Users who are members of multiple groups have each set of group events combined by OR.

1. In the Authentication dialog, select the Group Name in the Data Segmentation Search Filters section.
2. Click **Add Events to Group** and select an event in the Event Selection dialog. You can add multiple events to the same group list.
   - By default, the events are ANDed together, which means that AND is used as the operator when filtering sessions. When a session contains all of the events, it is viewable by that particular group.

Data segmentation by event is essentially an event-based session search. The search query is appended to every Search Server request made from either the Report Server or Portal Web application.

Following are some additional examples of event filtering.

Suppose you have configured the following three groups in Search Config:

- `tealeaf\usersevent 1tealeaf\eng` (Items AND'ed together)
- `event 2event 3tealeaf\qa` (Items OR'ed together)
- `event 4event 5event 6`

A user who's a member of `tealeaf\users` searches for session: `(canisterAppEvent contains 1) and (session)`

A user who's a member of `tealeaf\eng` searches for session: `(canisterAppEvent contains (2 and 3)) and (session)`

A user who's a member of both `tealeaf\eng` and `tealeaf\qa` searches for session: `(canisterAppEvent contains (2 and 3) or (4 or 5 or 6)) and (session)`

In the Authentication window, click **Events Visible in the Portal**. Check the events you want to be displayed in the Portal Web application for the selected group. If no events are selected, no events are displayed in the Portal when a member of that group logs on.

4. Configure Portal:
Verify that Portal NT Authentication is enabled.

1. In TMS, select the Tealeaf node.
2. Click **Shared Configuration information**.
3. Click **View/Edit**.
4. Click the Portal tab.
5. Click the Authentication Method setting.
6. Verify that **NT** is selected in the drop-down.

What the individual user sees in the Portal will largely depend on how the Administrator has configured that particular user.

- See “Configuring the Report Server” on page 58.

Using data segmentation to hide sessions:
In some cases, you may need to hide specific sessions from some Tealeaf users. This section provides a generalized approach for how to do it.

1. Create an event that is triggered in all sessions that you wish to hide. See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.
2. Through Search Server, create a group to contain all Tealeaf users who are not allowed to see the sessions.
3. Add the users to the group.
4. In event segmentation, add the created event to this group.
5. Set its operator as NOT.
6. Save changes.

Troubleshooting

For more information on troubleshooting, see "Troubleshooting - Searching" in the *IBM Tealeaf Troubleshooting Guide*.

On-Demand Privacy

When the IBM Tealeaf CX RealiTea Viewer standalone application or the Replay Server, which acts on behalf of Browser Based Replay users, request a session or a set of sessions for replay on the client application, Search Server queries the canisters to retrieve the sessions. Optionally, Search Server can be configured to open up the retrieved sessions and apply a pre-defined set of privacy rules to the sessions, based upon group membership of the requesting user.

In some cases, you may wish to capture data to the Tealeaf Canisters for long-term storage and search availability but do not wish to expose these data elements to users through replay.

- This set of privacy rules can different from the privacy rules applied through the PCA or the Windows pipeline.
- Privacy rules can be developed and applied for each user group to which you are applying on-demand privacy.

This section describes how on-demand privacy is configured and applied.

How On-Demand Privacy Is Applied

When RTV or BBR queries search server for a session to replay, Search Server examines the user groups to which the requesting user belongs. If a set of replay rules has been assigned to one of the user's groups, Search Server opens the data for the requested session and applies the set of replay rules to the session. Then, the session is delivered to the requesting application for replay to the user.

Note: On-Demand privacy rules are applied to Tealeaf Canisters only. On-Demand Privacy cannot be applied to HBR machines.

Note: On-Demand privacy rules are applied through user groups and cannot be applied selectively to individual users.

On-demand privacy enables you to apply privacy rules based upon a user's group membership. You may configure and apply separate sets of privacy rules for each user group. Through Search Server configuration, you may assign privacy rules to all users through a global configuration file and privacy rules to individual user groups based on separate configuration files.

Example Use

Fields that have been encrypted using privacy rules in the IBM Tealeaf CX Passive Capture Application or Windows pipelines cannot be decrypted in the Portal.

- These encrypted fields can be decrypted **only** during replay.

As an option, you can leave the configured fields in unencrypted state in the session data and then define On-Demand Privacy rules specifically to be applied during session replay, permitting the display of the unencrypted data in the Portal, as needed.

Authentication Required

On-Demand privacy works in conjunction with the enabled and configured method of authentication. Tealeaf supports two primary methods of authentication:

- **Portal authentication** - User requests of the Tealeaf system are authorized by the Tealeaf Portal application.

- **NT authentication** - User requests of the Tealeaf system are initially authorized by the Windows domain controller associated with the Tealeaf Portal application.

Note: The use of On-Demand Privacy requires Portal or NT authentication be enabled and configured. You may not use On-Demand Privacy if the method of authentication in Search Server configuration is set to `None`. See “Configuring the Search Server” on page 107.

For more information on authentication, see “Configuring the Search Server” on page 107.

For more information on the supported methods of authentication in general, see "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

Portal authentication and RTV

If you are using Portal authentication and the RTV application, you must configure the username and password of the Tealeaf user that is querying Search Server for sessions inside RTV. In the RTV menu, select **Tools** > **Options...** and click the IBM Tealeaf cxImpact tab. See "RealiTea Viewer - Advanced Options Tabs" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Multiple group membership

Privacy is applied to all groups for which on-demand privacy configurations have been configured in Search Server configuration.

- Privacy rules are applied to user groups in alphabetical order by group name. For example, if User 1 is a member of Group A and Group B, both of which have privacy rules specified for them, the rules of Group A are applied to session replay before Group B's rules, since that group appears first in alphabetical order.
- If a user is a member of a group that does not have privacy applied and a group that does have privacy applied, privacy is applied to the user's replay data. For example, suppose User 2 is a member of Group C, Group D and Group E, and Group D has a set of privacy rules while the other two groups do not. In this case, the privacy rules of Group D are applied.

On-demand privacy on events by Tealeaf version

Depending on the version of Tealeaf that captured and stored the session data, on-demand privacy may be applied differently on events:

- **Release 8.0 or later:** In these releases, event data is stored in the request of the page on which they were triggered. Based on the presence of a specific event, you may apply replay rules to any data on the page.
- **Release 7.2 or earlier:** In these releases, event data is stored on a separate page from the page on which the event occurred. There is no easy way to apply event-based replay rules to the parent page data.

Configuring On-Demand Privacy

On-Demand Privacy must be configured on the Tealeaf server that is the authentication master. Typically, this server is the Portal Server.

Note: On-Demand Privacy is a feature of Search Server and is configured using through Search Server configuration. However, at this time, you cannot configure On-Demand Privacy through the Tealeaf Management System, the preferred method of managing configuration. On-Demand Privacy must be configured

through the SearchConfig.exe tool in the Tealeaf install directory of the authentication master server. Screenshots and descriptions below refer to this tool.

- Each Canister that is not the Authentication Master must be configured separately to point to the Authentication Master server. See "Configuring authentication slave Canisters" on page 137.

Uploading Privacy Configuration Files

Before you begin, you may wish to upload one or more privacy configuration files to the authentication master server. On-demand privacy uses the same configuration file format as other forms of Tealeaf privacy. You should copy at least one Privacy.cfg file to the following directory on the authentication master server:

```
Tealeaf_install_directory\System
```

The Search Server configuration tool examines this directory to look for available privacy configuration files. Any .cfg file that is properly formatted for privacy configuration is available for use in on-demand privacy.

Note: You may wish to copy a global privacy file, which applies the most general privacy to the directory. Then, you can use that file to create other files containing privacy rules specific to individual user groups.

Release 8.0 and later only: If you do not have direct access to this server, you may use the Put File command in the TMS Advanced tab to place the configuration files in the Tealeaf install directory. See "TMS Advanced Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

On-Demand Privacy in Search Server Configuration

1. After you have uploaded the appropriate configuration files, to begin on-demand privacy configuration, double-click the following executable:
   ```
   <Tealeaf_install_directory>\SearchConfig.exe
   ```
2. The external SearchConfig utility is displayed.
3. Under Domain Local Groups, click **Modify...**.
4. Under Authentication Type, verify that NT Authentication or Portal Authentication is enabled. See "Authentication Required" on page 133.
5. The Authentication window is displayed:

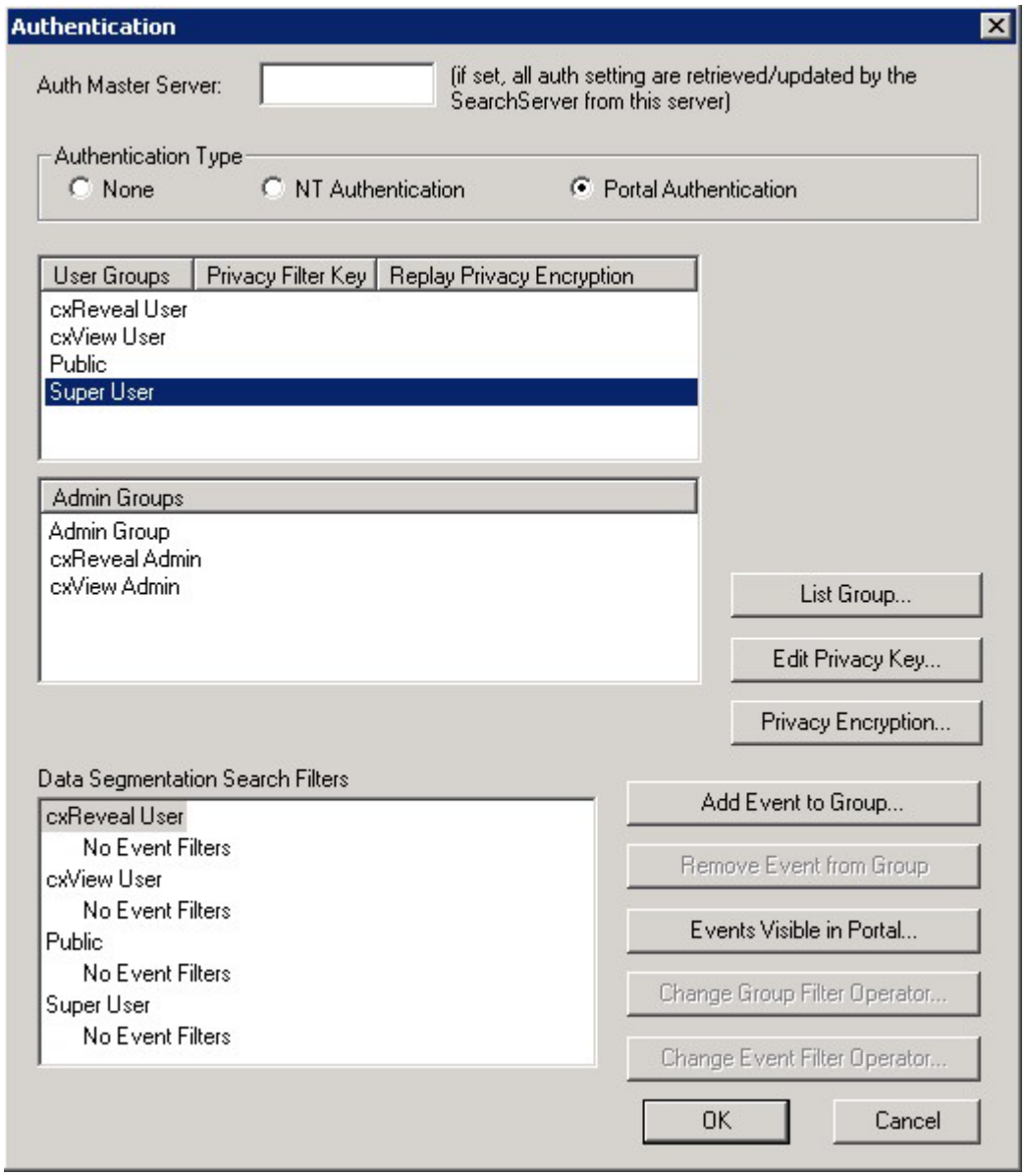


Figure 26. Authentication

6. For the selected type of authentication, the available user groups are displayed:

   Field **Description**

   `User Groups`
   The available user groups for the selected method of authentication

   `Privacy Filter Key`
   The privacy filter key applied to the user group. This setting does not apply to On-Demand Privacy. See "Configuring the Search Server" on page 107.

   `Replay Privacy Encryption`
   The privacy configuration file that is applied to members of this group when they request session data for replay.

Configuring the privacy file to use for a group:

To apply a configuration file for a specific user group, please complete the following steps.

1. In the Authentication window, select the group to which to apply a configuration file.
2. Click **Privacy Encryption...**.
3. The Privacy Encryption Config File dialog is displayed.

Figure 27. On-Demand Privacy - Select Config File

4. The list of available configuration files is displayed.
   - The list of files is populated based on a scan of the `Tealeaf_install_directory\System` directory. See "Uploading Privacy Configuration Files" on page 135.
   - If the server is also a Processing Server, the `Privacy.cfg` file used for the Windows pipeline is not available. It is stored in the parent directory to the `System` directory.
   - To review and edit a privacy file, select it and click **Open in Notepad...**. You can edit the file and save it back to the server.
   - To open the `System` directory to look for files, click **Open System Directory...**.
   - To apply a privacy file to the selected user group, select the file and click **OK**.
   - To choose to not apply privacy to the selected user group, click `None` and click **OK**. No privacy is applied to the group.
   - To cancel changes, click **Cancel**.
5. Repeat the above steps for other user groups, as needed.

Configuring authentication slave Canisters:
For Canisters that are not the Portal or NT Authentication master server, you must configure the Search Server for those Canisters to point to the authentication master server. This configuration can be performed through the Tealeaf Management System.

Note: This configuration applies only if you have multiple Canisters in your environment.

Note: When a new Canister is deployed, configuring the authentication master server should be performed as part of the initial configuration. Please verify the following steps.

1. Login to the Portal as an administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. Click the WorldView tab. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
4. Select a server that is not the authentication master.
5. Click the Search Server node.
6. Select **Search Server configuration**.
7. In the Config Actions panel, click **View/Edit**.
8. The Search Server configuration is displayed.
9. Under Domain Local groups, click **Modify...**.
10. For the Auth Master Server setting, please verify that it is pointing the authentication master server, which is typically the Portal Server. Modify the setting, if needed.

    Note: For the server hosting the Search Server that is the authentication master, this setting must be blank. The setting on the authentication master is verified in a later step.
11. Click **OK**.
12. Click **Save**.
13. When prompted, push this change to all servers and submit the job immediately.
14. Now, in the WorldView tab, select the server that is the authentication master.
15. Click the Search Server node.
16. Select **Search Server configuration**.
17. In the Config Actions panel, click **View/Edit**.
18. The Search Server configuration is displayed.
19. Under Domain Local groups, click **Modify...**.
20. For the Auth Master Server setting, this value must be blank.

    Note: For the Canister hosting the Search Server that is the authentication server, this setting must be blank.
21. Click **OK**.
22. Click **Save**.
23. When prompted, do not push the change to other servers.

All Canisters should now be properly configured to point to the authentication master server. See “Configuring the Search Server” on page 107. For more information on TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Updating slaves: At the specified authorization refresh interval, the slave servers of the authentication master copy the privacy configuration files to their local servers. By default, this updating occurs every five minutes.

- See “Configuring the Search Server” on page 107.

Replay Rules for Privacy

You may configure privacy rules for replay exactly as you would configure them in the PCA or the Windows pipeline. The exceptions and special features that apply to On-Demand Privacy only are listed below.

- For more information on developing privacy rules in general, see "Privacy Session Agent" on page 291.

Using RTV Privacy Tester for On-Demand Privacy Rules Development

To assist in the development of on-demand privacy rules, you may use the IBM Tealeaf CX RealiTea Viewer, which includes an embedded privacy tester that can be applied to sessions loaded from local disk or requested from Search Server.

Iteration cycles are very rapid:

- Edit the privacy rules configuration file locally in a text editor. Save your changes.
- Load the sessions in RTV.
- Open the Privacy Tester.
- Load the privacy rules configuration file.
- Privacy is applied to the selected sessions.
- Repeat the above steps until you are satisfied with the results.

See "RealiTea Viewer - Privacy Tester" in the *IBM Tealeaf RealiTea Viewer User Manual* for more information.

Use Blocking

Tealeaf privacy supports two methods of hiding data from users: encrypting or blocking. Encryption is useful if you wish to hide data from some users and expose it to others. However, since On-Demand Privacy can be selectively applied at the group level, there is no meaningful use for encrypting replay data. Encryption is also more expensive in terms of processing time.

Note: To hide data from users through On-Demand Privacy, use blocking rules instead of encryption rules.

Special On-Demand Privacy Functions

The following sections describe special privacy functions or keywords that have been implemented for On-Demand Privacy only.

`TL_USER_GROUPS` ReqField value: In On-Demand Privacy, you may define tests to evaluate the user groups to which the requesting user belongs.

In your privacy tests, you may use the following name/value pair to specify a test of the user groups to which the user requesting sessions for replay belongs:

```
ReqField=TL_USER_GROUPS
```

Example

In the following example, the rule (`[Rule9]`) is defined to block the response based on the following tests:

- `[SixPageTest]` - The URL of the requested page contains the value `six`.
- `[NotInSuperUserGroup]` - The user is not a member of the group `SuperUser`.

Note that the definition for [Rule9] includes the test operator (TestOp) of AND, which means that both of the above tests must evaluate to true in order for the specified actions (BlockRsp, ReqSetBlockedRsp) to be executed.

```
[Rule9]
Enabled=true
TestOp=AND
Tests=NotInSuperUserGroup, SixPageTest
Actions=BlockRsp, ReqSetBlockedRsp

[SixPageTest]
ReqField=URL
ReqOp=CONTAINS
ReqVal=six

[NotInSuperUserGroup]
ReqField=TL_USER_GROUPS
ReqOp=CONTAINS
ReqVal=SuperUser
CaseSensitive=False
Not=True

[BlockRsp]
Action=Block
Section=response
Field=body

[ReqSetBlockedRsp]
Action=ReqSet
ReqSetSection=env
ReqSetField=RspAltText
ReplaceString=<html>Response has been blocked for replay.</html>
```

TL_USER_NAME ReqField value: In your tests, you may also use the TL_USER_NAME value in the required field to apply replay rules to specific Tealeaf users.

In the example below, a test is defined to see if the requesting user name is johndoe. Note the case-insensitive configuration.

```
[isJohnDoe]
ReqField=TL_USER_NAME
ReqVal=johndoe
ReqOp=CONTAINS
CaseSensitive=False
```

Debug Mode

For privacy in the Windows pipeline, you can configure the Privacy or Extended Privacy session agent in TealeafCaptureSocket.cfg to generate log messages to assist in debugging your privacy rules.

On-demand privacy does not utilize this configuration file. To enable these debugging messages for your on-demand privacy rules, you may add the following section to the top of each configuration file used for on-demand privacy:

```
[Config]
LogLevel=debug
```

Note: Debug level may generate many log messages. It should be disabled as soon as you have resolved the issue.

To disable debug logging, set LogLevel to any value other than Debug. Or you may remove the above section from the .cfg file.

Logging and Reporting

When Replay Server delivers sessions, On-Demand Privacy is automatically applied, and the replay is logged in the usual manner. You can track replays through the Tealeaf Portal. See "Monitoring User Activity" in the *IBM Tealeaf cxImpact Administration Manual*.

Reference

- "Managing Data Privacy in Tealeaf CX" in the *IBM Tealeaf CX Installation Manual*
  - “Privacy Session Agent” on page 291
  - “Extended Privacy Session Agent” on page 261
  - “Privacy Tester Utility” on page 390
- On-Demand Privacy
  - "RealiTea Viewer - Privacy Tester" in the *IBM Tealeaf RealiTea Viewer User Manual*
  - “Configuring the Search Server” on page 107

Configuring the Alert Service

The Tealeaf Alert Service provides real-time alerting on Tealeaf events and Top Movers. Each alert can be configured to send email messages depending on threshold values defined for the event or Top Mover.

Tealeaf data is analyzed every minute, which allows the alerting engine to quickly inform users of issues that require attention. The Alert Service has the following features:

- Integrated into the event evaluation process on the Processing Server
- Aligned with the hourly or daily gathering of Top Mover data
- One-minute granularity in threshold calculations
- Summarizes alert information across multiple processing servers
- Each alert has independent configuration options: thresholds, warning, alert and black-out periods, and messaging options.

How Alerts Work

Event data inserted into the database includes a count of events that fired, the number of new sessions, and the number of new pages added on a per-minute basis.

Each minute, the Alert Service polls the database to identify the list of events that have fired in the last minutes or Top Movers that have been calculated.

- Events and Top Movers are compared the set of defined and active alerts to determine if any thresholds have been exceeded. If so, the corresponding alerts are fired.
- The timing of alerts is based upon the system clock of the IBM Tealeaf CX Passive Capture Application server.

  Note: Sessions that are being spooled by the Tealeaf Canister at the time of alert evaluation may not be included in threshold calculations.
- For events whose trigger is `End of Session` or whose reporting is set to `Report last occurrence`, the event time associated with the event is in the past because

of the need to wait for the session timeout. These events are timed to the evaluation time of the NALT table so that their counts are included in thresholds calculations.

- Each minute, two special records are updated with counts for new sessions and new pages, even if no new ones are added. These records serve as the heartbeat for the Alert Service. The hit time for the heartbeat record is taken to be the delivery time of the record.

Note: Since the Alert Service polls all Canisters on one-minute intervals, performance can be significantly impacted by network latency or other disruptions.

Installation

The Portal assumes the machine configured to be the Report Server in the Portal is where the Alert Service is running. The Alert Service needs to be running on that machine.

Alert Service Terminology

Understanding how the Alert Service works requires understanding a few key concepts.

Term **Definition**

`Intervals`

Alerting intervals can be configured to the minute. The smallest unit of time for accumulating event counts is one minute.

- All intervals are contiguous regardless of event activity.

`Rolling window of time`

Each alert has a configurable window of time in which event counts accumulate. The window does not have a defined start time such as the beginning of the hour or every half hour. The start time of the window equals the current time minus the alert interval size. This window can be smaller if an alert has happened any time during the alert interval.

- The size of the window is controlled by the Alert Interval setting for each event. The counts from each new minute are added to the window's accumulated count, and the count of the oldest minute is dropped off if it is outside the alert interval settings.

`Thresholds`

These values define when a warning or alert message is created. If the count surpasses one of these values and the alert is not in a reset interval, then a message is created.

- Alert thresholds take priority over warning thresholds.
- Negative thresholds are evaluated as "less than or equal to" the value rather than "greater than or equal to". A simple way to remember this concept is to think of small numbers as being alertable values. One example is inactivity on an event ("We had only 3 orders in the past 30 minutes").

`Reset Intervals`

Reset Intervals allow the Alert Service to suppress warnings and alerts for a configurable amount of time before it starts sending messages again. This feature prohibits repeating warning/alert messages (every minute) while an event is in a warning or alert status. The Alert reset interval for these alerts resets the event counter and the interval start time at the end of the reset period.

- Reset intervals do not apply to Top Mover alerts and Top Mover report alerts.

Creating Alerts

You can create alerts and the objects to trigger them through the Portal. See "Tealeaf Event Manager" in the *IBM Tealeaf Event Manager Manual*.

- See "TEM Alerts Tab" in the *IBM Tealeaf Event Manager Manual*.
- See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.
- See "TEM Top Movers Tab" in the *IBM Tealeaf Event Manager Manual*.

Configuration

You can configure the Alert Service through TMS.

To configure:

1. Login to the Tealeaf Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **TMS**.
3. In the Servers view, click **Alert Service**.
4. Click **Alert Service configuration**.
5. In the Config Actions panel, click **View/Edit**.

The following settings are available for editing. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Setting
Description

`Canister Attempts`
The number of times the service attempts to connect to a processing server for data collection at one minute intervals when the service is started. The service continues attempting to establish connection with any missing canisters at 10 minute intervals forever.

`Email From Address`
The email sending address for all email alert messages. Addresses can be in the following forms:

```
John Smith<johnsmith@example.com>
"John Smith"<johnsmith@example.com>
<johnsmith@example.com>
johnsmith@example.com
```

Note: Some email servers will not accept a From: email address with invalid formatting. Please be sure to configure a valid email address.

`Event Refresh Interval`
The interval at which the service attempts to refresh the event/alert definitions. The default value is `10` minutes; it should not be lower than 10 minutes.

`Logfile Verbosity`
This setting contols the content of the `TLAlertSrv_YYYYMMDD.log` file maintained in the `Logs` directory. By default, the logging level is set to `2` and should be kept at this level unless an issue required investigation.

- For gathering debugging data across multiple days, set this value to `4`.
- For gathering debugging data across hours within a day, you may set this value to `9`.

Note: After you have resolved any issue, you should reset the logging level to 2.

Maximum Length of Email Subject Line
Defines the maximum number of characters that can be used in the Subject line of the generated alert email. The maximum value for this setting is 255.

Message Attempts
The number of times the service attempts to send a single message

Minutes to Inhibit Alerts
If needed, you can apply an emergency shut-down of alert processing for the specified number of minutes. When the shut-down period expires, the Alert Service resumes operations automatically.
See "Shutting down alert generation."

Per Minute SQL Updates
When Enabled, the Alert Service can selectively insert informational records into a database to track Canister Status. These records are inserted every minute and might impact performance in installations with large numbers of Canister Servers.

Portal URL
The Web address for the Portal. In email alert messages, this address provides user access to the alert details through the Portal.

Record XML Data
When enabled, this setting writes XML data that is read by the Alert Service. In the Tealeaf\Portal directory, the following XML files are written: EventsReadbyAlertService.xml, ReportsReadbyAlertService.xml and TopMoversReadbyAlertService.xml.

Note: By default, this setting is disabled. This XML data is useful only for debugging purposes when working with Tealeaf Customer Support.

SNMP Monitors
A comma-separated list of SNMP servers that receive SNMP trap messages

Service Log File
Alert Service logs errors and debugging information to a file each day. The default value, TLAlertSrv.log yields files of the form TLAlertSrv_YYYYMMDD.log. This field allows user individualization of the base log file name.

Shutting down alert generation

If needed, you can force a temporary shut-down of the Alert Service, which prevents the generation of new alerts. When a non-zero value is entered for the Minutes to Inhibit Alerts setting and the configuration is saved and applied, the Alert Service prevents the generation of any new alerts for the specified number of minutes, regardless of how individual alerts are defined.

This feature may be helpful in debugging alerts that are firing too frequently due to improper specification of the source event or other mis-configuration in the alert definition.

When the specified period has expired, Alert Service resumes operating normally.

Note: When this value is changed through TMS, the value is applied to the corresponding registry setting, from which Alert Service reads and applies to its

behavior. When the shut-down period has expired, Alert Service resets the registry setting to `0`, which enables it to resume normal operations, but the setting in TMS is not reset automatically.
If you reload the Alert Service configuration through TMS, it recognizes that there is a difference between the registry setting (`0`) and the value stored in TMS (`20`). To resynchronize the values, you should either manually reset the value in TMS or reload the configuration from the local system when prompted.

Configuring SNMP Traps

Tealeaf supports the ability to send SNMP traps to SNMP listeners.

Note: Tealeaf does not provide a Management Information Base (MIB) file for monitoring alerts.

To enable:

1. In the Alert Service configuration in TMS, click **SNMP Monitors**.
2. Enter a comma-separated list of servers to send SNMP traps.
3. Click **Save**.
4. Configure a TMS task to update the configuration of all affected servers.

To monitor SNMP Traps:
Tealeaf does not provide an MIB file with which to monitor SNMP traps. However, Tealeaf does send a simple text SNMP trap, and you can configure your external application to monitor Tealeaf events using the following information.

The SNMP trap OID structure can be used to determine which alert fired. The Tealeaf company ID is `9147`. An alert trap has the following OID:

```
1.3.6.1.4.1.9147.0.1.<Event ID>
```

The message in the alert is in the following format:

```
ALERT DETAILS: <Alert Title>
```

You can create a filter based on the OID to allow the external receiver to monitor specific events.

Canister Statistics

As part of its operations, the Alert Service retrieves and inserts Canister statistics for all Canisters identified in the Portal into the `TL_STATISTICS` database.

- The writing of statistics is enabled via the `Per Minute SQL Updates` parameter. See “Configuration” on page 143.
- Some of these statistics appear in the Canister Status reports. See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

Starting/Stopping/Restarting the Service

You can start, stop, and restart the Alert Service through TMS.

To configure:

1. Login to the Tealeaf Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **TMS**.
3. In the Servers view, click **Alert Service**.
4. In the Component Actions pane, you can click the **Start**, **Stop**, or **Restart** buttons.

Configuring the Scheduling Service

The Tealeaf Scheduling Service can be used to schedule repeated Tealeaf-specific jobs, which include TLI archiving, backups, and extractions. During installation, the Tealeaf Scheduling Service is configured to automatically start up, yet some default jobs are disabled.

Note: The Tealeaf Scheduling Service should not be used for scheduling and executing Tealeaf-related jobs other than those specified in this section.

Enabling Tealeaf Scheduling Service

By default, the Tealeaf Scheduling Service is automatically started and enabled during initialization of the Tealeaf server.

- To enable or disable the service, use the Windows Service Control Panel to start or stop the `Tealeaf Scheduling Service`.

Configuring Tealeaf Scheduling Service

The service is configuring using an `.XML` file stored in the following location:

`<Tealeaf_install_directory>\Tools\TlSchedulersvccfg.xml`

The default configuration file included during installation contains the specification for jobs of three different types. By default, all are disabled.

Note: Before you begin editing the above file, you may want to save the original as a backup.

Default Configuration

The following `.XML` is the default configuration provided during the installation process. For more information on each type of job configuration:

- "Configuring TLBackup Jobs" on page 148
- "Visitor Database Extractor" on page 149
- "Configuring TLI Jobs" on page 149
- "Configuring Tealeaf Status Jobs" on page 150

```
<JobDefinitions>
<!--
    Available repeat commands:
    RepeatEvery5Cmd        - runs every 5 minutes
    RepeatEvery10Cmd       - runs every 10 minutes
    RepeatEvery15Cmd       - runs every 15 minutes
    RepeatEvery30Cmd       - runs every 30 minutes
    RepeatEvery60Cmd       - runs every 60 minutes
    RepeatDailyCmd         - runs every day at a set time.
-->
<!-- Run TealeafStatus every 15 minutes -->
<Job Enable="False" Name="TealeafStatus" RunType="RepeatEvery15Cmd"
   DailyStartTime="" CmdString="tools\TealeafStatus.exe" />

<!-- Run Cycle Services at 00:30 AM every day -->
<Job Enable="True" Name="Cycle"  RunType="RepeatDailyCmd"
   DailyStartTime="00:30" CmdString="tools\TLBackup.exe -C" />

<!-- Run Extractor for Visitor DB every 15 minutes -->
<Job Enable="False" Name="VisitorDBExtract" RunType="RepeatEvery15Cmd"
   DailyStartTime="" CmdString="Reporting\TLExtractorVDB.exe" />

<!-- Run TLManageTLI to trim any TLI files old than 31 days, runs at 02:30 AM
     every day -->
```

```
<Job Enable="False" Name="TLI_Trim"  RunType="RepeatDailyCmd"
   DailyStartTime="02:30" CmdString="tools\TLManageTLI.exe -server servername
   -trim -days 31" />

<!-- Run TLManageTLI to merge previous days TLI file, runs at 02:30 AM every
     day -->
<Job Enable="False" Name="TLI_Merge"  RunType="RepeatDailyCmd"
   DailyStartTime="02:30" CmdString="tools\TLManageTLI.exe -server servername
   -merge" />

</JobDefinitions>
```

Job properties: For each job definition, the following properties must be specified:

Property
: **Description**

Enable To enable the job, set this value to `true`.

Name The name of the job must be unique within the set of job definitions.

RunType
: Defines the frequency at which the job is executed. See "Types of runs."

DailyStartTime
: If the job is configured to run once per day, this value defines the start time for the job in `hh:mm` format. For example, a `00:30` job runs at 12:30am.

CmdString
: This value is the command that is executed at the command line by the scheduling service at the scheduled time.

  Note: Path names are relative to the Tealeaf install directory. You cannot use environment variables in the path names.

Types of runs: At the top of the file is listed the commands for configuring the frequency of job execution.

Note: Avoid changing the job frequency for the default job configurations. Changing the frequency of these jobs may affect the behavior and performance of the Tealeaf system.

Note: Do not schedule jobs to run more frequently than every fifteen minutes unless directed by Tealeaf.

Command
: **Description**

RepeatEvery5Cmd
: Runs every 5 minutes.

RepeatEvery10Cmd
: Runs every 10 minutes.

RepeatEvery15Cmd
: Runs every 15 minutes.

RepeatEvery30Cmd
: Runs every 30 minutes.

RepeatEvery60Cmd
: Runs every 60 minutes.

RepeatDailyCmd
Runs every day at a set time.

This service cannot be used for scheduling non-repeating jobs. To schedule a one-off job, set the repeat command to `RepeatDailyCmd` and disable the job after it successfully executes.

- Only one scheduled job can run at a time. If execution of a scheduled job overlaps the start time of another job, the second job is executed after completion of the first job.

Configuring TLBackup Jobs

The TLBackup job can execute the Tealeaf Backup utility, which can perform any of the following jobs:

- Partial backup
- Full backup
- Cycle all Tealeaf Services

Note: By default, the nightly Cycle Services job is enabled and configured to execute at 12:30am. Tealeaf recommends that the default Cycle Services job be enabled and executed once per day.

Additional configuration options are available through the configuration file for `TLBackup`. Restoring from backup requires a separate utility. See "TLBackup and TLRestore" in the *IBM Tealeaf cxImpact Administration Manual*.

To enable the TLBackup job:

The job for the default Scheduling Service (`Name="Cycle"`) is configured to execute a CycleServices job to restart all Tealeaf services at 12:30am. Please complete the following steps to verify this configuration.

1. Open the `TlSchedulersvccfg.xml` file.
2. For the `Name="Cycle"` job:
   a. Set `Enable` to `true`.
   b. Changing the `RunType` setting is not recommended. See “Types of runs” on page 147.
   c. If `RunType="RepeatDailyCmd"`, then you must configure the start time. Times are specified on the 24-hour clock. For example, the following job executes at 12:30 am according to the Tealeaf timezone.
      `DailyStartTime="00:30"`
      - For more information on timezones, see "Configuring the System Timezone" in the *IBM Tealeaf CX Configuration Manual*.
   d. Verify that the `CmdString` points to `TLBackup.exe` inside the Tealeaf install directory.
      - The default job includes the `-C` parameters, which cycles all Tealeaf services. For more information on parameters for other job types, see "TLBackup and TLRestore" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Save the file. A restart is not required.
4. At the appointed time, the scheduled job is executed.

See "TLBackup and TLRestore" in the *IBM Tealeaf cxImpact Administration Manual*.

Visitor Database Extractor

The Visitor database extractor job is used for extracting session data from the Long-Term Canisters and inserting them in the proper format into the IBM Tealeaf cxResults staging database.

Note: If you have licensed IBM Tealeaf cxResults, this job must be enabled after all software has been installed and database connectivity has been established. IBM Tealeaf cxResults is not operable until this job is enabled and functioning.

To enable the VDBExtractor job:

1. Open the `TlSchedulersvccfg.xml` file.
2. For the `Name="VisitorDBExtract"` job:
   a. Set `Enable` to `true`.
   b. Do not modify any of the other settings.
3. Save the file. A restart is not required.
4. At the appointed time, the scheduled job is executed.

Configuring TLI Jobs

Through the Scheduling Service, you can configure and enable jobs to trim and merge TLI files stored on the designated TLI server.

A **TLI file** contains static content objects that have been captured by Tealeaf and stored in daily archives for replay and long-term storage purposes. See "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

Note: Before you configure TLI jobs, you must designate and enable one Tealeaf server to be the TLI server. See "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

You can verify the proper capture of static content in archives through RTV. See "Using Static Archives in RTV" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Note: To back up TLI files before trim and merge operations, add the switch `-backup` to the `CmdString` in the job specification. Prior to executing the specified job, the affected TLI files are backed up to the backup directory in the server.

Configuring TLI trim jobs:
You may configure jobs to trim content from the TLI server when it is aged more than a specified number of days.

- TLI trim operations trim daily `.TLI` files from the live and backup directory.
- Content is removed based on the modified timestamp of each `.TLI` file on the server.
- You may review the `.TLI` files currently stored on the TLI server, including their last modification date. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Note: You should configure the Trim job to run on a daily basis.

Note: Tealeaf supports one TLI server in the environment. Multiple TLI servers are not currently supported. For more information on creating a TLI server, see "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

To enable the TLI trim job:

1. Open the TlSchedulersvccfg.xml file.
2. For the Name="TLI_Trim" job:
   a. Set Enable to true.

      Note: Depending on available storage, you may wish to change the number of days of TLI data retained on the server. In the CmdString value, set the -days parameter to be the number of days of TLI files retained. Tealeaf recommends using the default settings until you have confidence in the volume of static content stored on a daily basis.
   b. Replace the servername value with the host name of the TLI server in your environment.
3. Save the file. A restart is not required.
4. At the appointed time, the scheduled job is executed.

Configuring TLI merge jobs:
Through the Portal, you can manage the merging of daily .TLI files into the monthly file, which can then be extracted for permanent storage. When executed on a daily basis, TLI Merge jobs roll the content from the previous day's .TLI file into the monthly file and optionally move the source file to the TLI backup directory. In this manner, static content is aggregated for delivery to the permanent data warehouse.

- As part of the merge operation, the Portal attempts to match static objects from the daily file with other instances of the object in the monthly file by using a unique composed of the URL for the object and a checksum. If a match is found, a simple reference to the object already written into the monthly file is created, instead of adding a second instance of an identical object.
- You may review the .TLI files currently stored on the TLI server, including their last modification date. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Any merge operation also rolls the monthly TLI file when it is executed after the beginning of the new month.

Note: You should configure the Merge job to run on a daily basis.

Note: After a monthly .TLI file has been closed, the file remains on the server. It is the customer's responsibility to manage monthly .TLI static archives.

To enable the TLI merge job:
1. Open the TlSchedulersvccfg.xml file.
2. For the Name="TLI_Merge" job:
   a. Set Enable to true.
   b. The DailyStartTime value should be set to the same time as the time configured for the Trim job.
   c. Replace the servername value with the host name of the TLI server in your environment.
3. Save the file. A restart is not required.
4. At the appointed time, the scheduled job is executed.

Configuring Tealeaf Status Jobs

Enabling jobs:

The Tealeaf Status job generates the Tealeaf Status report at specified intervals for delivery through email. This job gathers data from servers in the Tealeaf environment on their current operating conditions and captured data.

- Ad-hoc versions of the Tealeaf Status report can be generated through the Portal for display in a browser window. See "Portal Logs" in the *IBM Tealeaf cxImpact Administration Manual*.
- The Tealeaf Status report supersedes the deprecated Portal Status report. See "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*.

To enable the Tealeaf Status job:

1. Login to the Tealeaf Portal as an administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**. The Tealeaf Management System is displayed.
   - See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Click the WorldView tab. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
4. From the View drop-down, select `Servers`.
5. Click the Scheduling Service node.
6. Click **Scheduling Service configuration**.
7. From the Config Actions panel, click **View/Edit**. The `TlSchedulersvccfg.xml` file is displayed.
8. For the `Name="TealeafStatus"` job:
   a. Set `Enable` to `true`.
   b. Changing the `RunType` setting is not recommended. See “Types of runs” on page 147.
   c. TealeafStatus should be configured to run every fifteen minutes. Set `RunType="RepeatEvery15Cmd"`.
   d. Verify that the `CmdString` points to `TealeafStatus.exe`, relative to the Tealeaf install directory. This value should be:
      `Tools\TealeafStatus.exe`
9. Save the file.
10. Push the configuration changes to all servers in the environment. A restart is not required.
11. At the appointed time, the scheduled job is executed.

- See "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring the Tealeaf Status report:
You can configure the Tealeaf Status report to display `INFO`, `WARNING` and `ERROR` messages based on values that you specify in the configuration.

Please complete the following steps to configure your Tealeaf Status report.

1. Login to the Tealeaf Portal as an administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**. The Tealeaf Management System is displayed.
   - See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Click the WorldView tab. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
4. From the View drop-down, select `Servers`.

5. Click the Scheduling Service node.
6. Click **Tealeaf Status configuration**.
7. From the Config Actions panel, click **View/Edit**. The `TealeafStatus.ini` file is displayed.
8. Configure each section of the Tealeaf Status report:
   - "TealeafStatus"
   - "DataService" on page 153
   - "Email" on page 153
   - "PcaThresholds" on page 153
   - "CanisterThresholds" on page 154
   - "ReportThresholds" on page 154
   - "IgnoreEventList" on page 154
   - "NoErrorEventList" on page 155
   - "NoErrorEventList" on page 155
   - "RepeatEventList" on page 155
9. Save the file.
10. Push the configuration changes to all servers in the environment. A restart is not required.

The following sections describe individual configuration blocks in the Tealeaf Status configuration.

TealeafStatus: General configuration parameters for the Tealeaf Status report.

```
[TealeafStatus]
CompanyName=myCompany
GeneralReportTime=07:00
MinutesToBetweenErrorReport=180
BlackOutPeriod=00:15,00:45
WriteReportToFile=True
ReportFileName=TealeafStatus.html
```

Property
Description

`CompanyName`
Name of company or environment for which the Tealeaf Status report is being generated.

`GeneralReportTime`
Time in 24 hour clock to generate the report.

`MinutesToBetweenErrorReport`
Minutes between generation of error reports

`BlackOutPeriod`
Start and end time of the blackout period. Blackout period should be configured during system maintenance period.

`WriteReportToFile`
When set to `True`, the report is written to the `ReportFileName` filename.

Note: `WriteReportToFile` must be set to `False` to generate Tealeaf Status emails.

`ReportFileName`
Filename of the HTML to which the report is written, if enabled.

DataService: Connection information for connecting to the Tealeaf Data Service.

- See "Configuring the Tealeaf Data Service" in the *IBM Tealeaf CX Configuration Manual*.

```
[DataService]
server=sierra
port=23000
```

Property
Description

server The identifier for the server that hosts the Tealeaf Data Service. See "Configuring the Tealeaf Data Service" in the *IBM Tealeaf CX Configuration Manual*.

port The port number through which to communicate with the Tealeaf Data Service

Email: Email parameters.

Note: `WriteReportToFile` must be set to `False` to generate Tealeaf Status emails.

```
[Email]
From=TeaLeafAdmins@company.com
To=stakeholders@company.com
Subject=Tealeaf Status
```

Property
Description

From The email address from which the Tealeaf Status report is sent

To A comma-separated list of email addresses of recipients of the email version of the Tealeaf Status report.

Subject
The Subject line of the email

PcaThresholds: Defines thresholds for the IBM Tealeaf CX Passive Capture Application. When these thresholds are exceeded, an error is indicated in the Tealeaf Status report. For more information on these statistics, see "PCA Web Console - Statistics Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

```
[PcaThresholds]
MaxIdle=120
MaxCpu=75
MaxRestart=0
MaxCacheSSLMisses=10000
```

Property
Description

MaxIdle
The maximum idle time in seconds, after which Tealeaf Status reports a non-response PCA

MaxCpu The maximum CPU use rate as a percentage, above which Tealeaf Status reports an overburdened PCA

MaxRestart
The maximum number of restarts since the last Tealeaf Status report, above which Tealeaf Status reports the count

MaxCacheSSLMisses
When an SSL session record comes in for decryption, it is checked to see if decryption cipher info for that session is in the cache. If not, it is counted

as a cache miss. These misses can happen if Passive Capture was restarted and began capturing in-progress SSL sessions or it has exceeded the default 10,000 concurrent SSL session cache entries and the LRU entries were deleted.

CanisterThresholds: Thresholds for the Tealeaf Canister or Canisters in the system. For more information on these statistics, see "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

```
[CanisterThresholds]
CanisterDiskPctFree=5
WaitToBeEval=20000
WaitToBeLongTermed=20000
UnEvaluatedHits=10000
UnIndexedSessions=20000
MaxLssnDisplayCount=7
```

Property
Description

CanisterDiskPctFree
Minimum disk space as a percentage, below which Tealeaf Status reports as an error.

WaitToBeEval
Maximum number of sessions waiting to be evaluated, above which Tealeaf Status reports as an error.

WaitToBeLongTermed
Maximum number of sessions waiting to be closed and moved to the Long Term Canister on disk, above which Tealeaf Status reports as an error.

UnEvaluatedHits
Maximum number of hits that have not yet been evaluated, above which Tealeaf Status reports as an error.

UnIndexedSessions
Maximum number of sessions that have not been indexed, above which Tealeaf Status reports as an error.

MaxLssnDisplayCount
Maximum number of updated LSSN records to be displayed. There is no upper limit to this setting.

ReportThresholds: These thresholds pertain to the report database activities.

```
[ReportThresholds]
ReportInvalidIndexDelay=86400
DefaultMaxInvalidIndexPaths=12
```

Property
Description

ReportInvalidIndexDelay
The maximum number of seconds to wait for an invalid index to be corrected, after which it is reported as an error

DefaultMaxInvalidIndexPaths
The maximum number of invalid index paths, above which Tealeaf Status reports as an error.

IgnoreEventList: In this section, you can configure events from the Application Event Log to ignore for inclusion in the Tealeaf Status report.

```
Event_<n>=[EventSource],[Category],[EventID],[MessageType]
```

```
Event_1=TeaLeaf Report Service,TeaLeafAlert,ALL,ALL
Event_2=TeaLeaf Event Reporter,ALL,10241,ALL
Event_3=TeaLeaf Session Indexer,ALL,9833,INFO
```

Property
Description

Property
test

<n> a number, each one must be unique

[EventSource]
Name of the event source

[Category]
Event category or ALL

[EventID]
Number of the event id or ALL

[MessageType]
The type of event to report: ALL, ERROR, WARN, and INFO

NoErrorEventList: Application Event Log events can be specified in this section if you do not want them to generate an error in the Tealeaf Status report.

```
[NoErrorEventList]
Event_1=TeaLeaf Report Service,TeaLeafRS,200,ERROR
Event_2=TeaLeaf Report Service,TeaLeafRS,201,ERROR
Event_3=TeaLeaf Session Indexer,ALL,9845,ERROR
Event_4=TeaLeaf Session Indexer,ALL,9745,ERROR
Event_5=TeaLeaf Session Indexer,ALL,9753,ERROR
```

For more information on the format, see “IgnoreEventList” on page 154.

RepeatEventList: In this section, you can list Application Event Log events that should only be listed once. Configuring this section for events that are likely to repeat many times can greatly reduce the size and clutter of your Tealeaf Status reports.

```
[RepeatEventList]
Event_1=TeaLeaf Alert Service,TeaLeafAS,200,INFO
Event_2=TeaLeaf Alert Service,TeaLeafAS,201,INFO
Event_3=TeaLeaf Session Indexer,Check,12553,INFO
Event_4=TeaLeaf Session Indexer,Control Prog,9834,INFO
Event_5=TeaLeaf Pipeline,All,16,WARN
```

For more information on the format, see “IgnoreEventList” on page 154.

Configuring Portal Status Jobs

Note: DEPRECATED FEATURE:
The Portal Status Report has been superseded by the "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*, which requires no additional configuration. For legacy customers, the following configuration documentation is retained. In a future release, it may be removed. If you are using Portal Status, it is recommended that you migrate to using the "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*. For more information, see “Configuring Tealeaf Status Jobs” on page 150.

The Portal Status job gathers a useful set of data and delivers it to the Tealeaf Portal for review. Through Portal Status, you can monitor critical aspects of the Tealeaf platform.

To enable the Portal Status job:

1. Open the `TlSchedulersvccfg.xml` file.
2. For the `Name="Status"` job:
   a. Set `Enable` to `true`.
   b. Changing the `RunType` setting is not recommended. See "Types of runs" on page 147.
   c. If `RunType="RepeatDailyCmd"`, then you must configure the start time. Times are specified on the 24-hour clock. For example, the following job executes at 11:30 pm according to the Tealeaf timezone.

      ```
      DailyStartTime="23:30"
      ```

      - For more information on timezones, see "Configuring the System Timezone" in the *IBM Tealeaf CX Configuration Manual*.

   d. Verify that the `CmdString` points to `PortalStatus.exe` inside the Tealeaf install directory.
3. Save the file. A restart is not required.
4. At the appointed time, the scheduled job is executed.

Configuring Additional Jobs

You may specify additional jobs by completing the following steps.

Note: You should specify only the minimum set of jobs required to meet your needs. Depending on the type of job and the volume of data processed, these jobs may impact system performance. Where possible, you should configure jobs to execute during off-peak hours.

1. Copy the XML specification for a job that is similar to the job you're creating.
2. Change the value of the `Name` attribute to a new name that is unique within the available job names.
3. Specify the other properties.

   Note: The job should be configured to execute at a time that does not overlap with other scheduled and enabled jobs.
4. Save the configuration.

Configuring the Extract Service

The Tealeaf Extract Service is used by Tealeaf products to extract session data from the Tealeaf databases for packaging and delivery to third-party systems. Tealeaf Extract Service is used by IBM Tealeaf cxConnect for Data Analysis and IBM Tealeaf cxVerify during normal operations and must be enabled and operational for use with those products.

Note: IBM Tealeaf cxConnect for Data Analysis and IBM Tealeaf cxVerify are separately licensable components of the IBM Tealeaf CX platform.

- For more information about IBM Tealeaf cxConnect for Data Analysis, please contact your IBM Tealeaf representative.
- IBM Tealeaf cxVerify is no longer available as a newly licensed product as of Release 8.7. Customers that licensed IBM Tealeaf cxVerify in Release 8.6 and

earlier may continue to use and receive support for the product in Release 8.7 and later. For more information, please contact Tealeaf Customer Support .

When a IBM Tealeaf cxConnect for Data Analysis or IBM Tealeaf cxVerify task is executed, the query to retrieve the specified sessions is prepared and delivered to the Tealeaf Extract Service, which is responsible for executing the query and returning the sessions to the calling program.

Configuration

You can configure the Extract Service through TMS.

To configure:

1. Login to the Tealeaf Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **TMS**.
3. In the Servers view, click **Extract Service**.
4. Click **Tealeaf Extractor Service configuration**.
5. In the Config Actions panel, click **View/Edit**.
6. The following settings are available for editing. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Setting
Description

`ConcurrentJobs`
The maximum number of IBM Tealeaf cxConnect for Data Analysis and IBM Tealeaf cxVerify jobs that are permitted to run concurrently.

- The default value is `1`.

`DBThreads`
The number of database threads used by the Tealeaf Extract Service to retrieve sessions.

- The default value is `10`.

`DeferTime`
The number of minutes that the job is delayed before it is run again when session search indexes are not available. Jobs may be run up to the `MaxRetries` number of attempts.

- The default value is `60`.

`DispReschdJobs`
When set to `1`, rescheduled IBM Tealeaf cxConnect for Data Analysis and IBM Tealeaf cxVerify are displayed in the Tealeaf Portal.

- The default value is `0`.

`DisplayDays`
The number of days to display a scheduled IBM Tealeaf cxConnect for Data Analysis or IBM Tealeaf cxVerify scheduled job in the Tealeaf Portal.

- The default value is `7`.

`Enable-TransactionLog`
When set to `True`, this option enables transaction logging for the Extractor Service, which allows IBM Tealeaf cxConnect for Data Analysis to resume a job where it left off, if the job fails for some reason.

`ExtendedJobLog`
When set to `1`, the Tealeaf Extract Service writes an extended log file for each job, which is useful for debugging purposes.

- The default value is 1.

ExtractorMode
Installation parameter. Please do not change.
- The default value is 1.

ExtractorServicePath
The path to the TLExtractService.exe file. By default, this service executable is located in the following directory:
<Tealeaf_install_directory\DataExtractor

LogLevel
The log level for the Tealeaf Extract Service (1-5).

Note: Log level 5 is for debugging purposes only.
- The default value is 1.

MaxErrors
The maximum number of permitted errors before a job is failed.
- The default value is 5.

MaxRetention
The maximum number of days that a IBM Tealeaf cxConnect for Data Analysis or IBM Tealeaf cxVerify job is persisted.
- The default value is 5.

MaxRetries
When a IBM Tealeaf cxConnect for Data Analysis or IBM Tealeaf cxVerify job fails, this setting specifies the maximum number of attempts that the Tealeaf Extract Service makes to execute the job before failing the job.
- The default value is 2.

PassdueDays
The maximum number of days that a pass due job is allowed to be retrieved, before it is failed.

SSThreads
The number of Search Server threads used by Tealeaf Extract Service.
- The default value is 10.

Reference

IBM Tealeaf cxConnect for Data Analysis: See "cxConnect Configuring Tasks" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.
IBM Tealeaf cxVerify: See "cxVerify Configuring Tasks" in the *IBM Tealeaf cxVerify Administration Manual*.

Chapter 3. Initial CX Configuration

After you have successfully installed the PCA and Windows software, you can use the following steps as a means of performing the initial configuration of your IBM Tealeaf CX solution. There is no required order of completing these configuration tasks. However, for best results, it is recommended that you complete the following steps in the listed order.

Additional optional configuration steps are listed below.

Event Model Backup

Before you begin making modifications to your event object definitions, you may want to perform a backup, which can be used to restore your event model to its previous state. See "Event Model Backup and Restore" in the *IBM Tealeaf cxImpact Administration Manual*.

Tealeaf CX Configuration

Note: Before completing these steps, all required Linux and Windows software must be installed on all servers in the Tealeaf environment. See "CX Installation" in the *IBM Tealeaf CX Installation Manual*.

Note: This sequence of steps provides a framework for configuring the IBM Tealeaf CX solution. These steps should be reconciled with and adjusted based on the specifics of your Tealeaf solution. If you have questions, please contact http://support.tealeaf.com.

Initial Configuration Steps

1. "Initial PCA Configuration" in the *IBM Tealeaf Passive Capture Application Manual*
2. “Initial TMS Configuration” on page 169
3. “Initial Portal Configuration” on page 160 The configuration steps include IBM TealeafcxView configuration. For more information on IBM TealeafcxView, see "cxView User Manual" in the *IBM Tealeaf cxView User Manual*.
4. “Initial Pipeline Configuration” on page 221

   Note: For enterprise security reasons, it may be important to immediately implement privacy rules. Please complete the steps on this page for any implementation.

Optional Configuration

Initial Configuration of Optional Components: The following pages describe the configuration of several separately licensable components of the IBM Tealeaf CX solution. please contact your IBM Tealeaf representative.

1. "Initial RTV Configuration" in the *IBM Tealeaf CX Configuration Manual*
   - RTV is installed through a separate installer from IBM Tealeaf cxImpact. See "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*
2. "Initial cxResults Configuration" in the *IBM Tealeaf cxResults Administration Manual*

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3. "Initial cxReveal Configuration" in the *IBM Tealeaf cxReveal Administration Manual*
4. "Initial CX Mobile Configuration" in the *IBM Tealeaf CX Configuration Manual*
5. "Initial cxConnect Configuration" in the *IBM Tealeaf CX Configuration Manual*
   - IBM Tealeaf cxConnect for Data Analysis is installed through a separate installer from IBM Tealeaf cxImpact. See "cxConnect Installation" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.
6. "Initial cxVerify Configuration" in the *IBM Tealeaf CX Configuration Manual*
   - IBM Tealeaf cxVerify is installed through a separate installer from IBM Tealeaf cxImpact. See "cxVerify Installation" in the *IBM Tealeaf cxVerify Administration Manual*.

Verifying Your Tealeaf Solution

After you have completed installation and initial configuration of each component in your Tealeaf solution, you should verify operations of all major components.

- See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

Initial Portal Configuration

Note: This section provides a framework for performing the initial configuration of one component of the IBM Tealeaf CX system in a simplified deployment model. Depending on your Tealeaf solution's deployment, additional configuration may be required. If you have any questions about configuration, contact http://support.tealeaf.com.

After you log in to the Portal for the first time, perform the tasks that are listed in this section to complete the basic configuration of the IBM Tealeaf cxImpact product.

Portal Announcements

With each installation or upgrade, it is recommended that you create a Portal Announcement for display to users as to the current stage of the machine, its state, and whether there are any current issues that might impact Tealeaf users. The following are example messages:

- Stage: Proof of Concept

```
Stage: Proof of Concept
State: Functional
Notes:
This system is intended to demonstrate Tealeaf capabilities only.  This system
should not be used for any functions other than demonstrating system
functionality.

For more information, contact your Tealeaf administrator. From the Portal
menu, select Help > Contact Tealeaf Administrator.
```

- Stage: Development

```
Stage: Development
State: Functional
Notes:
This system is under construction. Users may experience problems using the
system.

For more information, contact your Tealeaf administrator. From the Portal
menu, select Help > Contact Tealeaf Administrator.
```

- Stage: Staging

```
Stage: Staging
State: Functional
Notes:
This system is currently being tested for production release. Please report
any problems.

For more information, contact your Tealeaf administrator. From the Portal
menu, select Help > Contact Tealeaf Administrator.
```

- Stage: Production

  Note: For most production environments, a Portal Announcement is unnecessary. If you create one following the pattern above, it should expire within a few days of launching the production environment.

For more information on configuring and enabling Portal Announcements, see "Portal Announcements" in the *IBM Tealeaf cxImpact Administration Manual*.

Configure Tealeaf System Time Zone

In the Tealeaf system time zone is used by all Tealeaf servers to synchronize a variety of tasks. During the installation process, this system-wide setting must be defined and applied to each server in the environment.

- See “Configuring the System Timezone” on page 12.

Miscellaneous Settings

In the **Miscellaneous settings** panel, you can define a variety of settings, including the contact information for the Tealeaf administrator. See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Server Configuration

Authentication

At this time, you can configure the method of authentication used by the Tealeaf Portal and other services. Search Server must be made aware of the mode of authentication. See “Configuring the Search Server” on page 107.

For general information on authentication methods, see "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

Configure Machine Reference Values

During the installation process, reference values for the machines hosting Tealeaf servers and services are inserted into the database for use by the Portal. The sections below describe the recommended values depending on your deployment scenario.

General Notes:

- For Search Server, all machines on which Search Server is installed must have their Portal Server setting pointing to the machine on which the Portal is installed. This setting must be blank on the Portal machine itself. When the Data Service is running on the Report machine, however, all Search Servers should point their Portal server at the Report machine.

Deployment - All-in-One: Portal Management Page:

Server Name
Recommended Value

Report Server
current machine name (not `localhost`)

Data Service
current machine name (not `localhost`)

- These values can be reviewed and changed through the Portal Management page. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Search Server Configuration:

Server Name
Recommended Value

Portal Server
leave blank

Data Service
current machine name (not `localhost`)

These values can be reviewed and changed through Search Server configuration. See “Configuring the Search Server” on page 107.

Deployment - Multi-Server: In a typical multi-system deployment, the Windows servers are configured as follows:

- 1 Portal and Report Machine
- 1 or more Processing Server Machines (Canister(s))

Portal and Report Machine: Portal Management Page:

Server Name
Recommended Value

Report Server
current machine name (not `localhost`)

Data Service
current machine name (not `localhost`)

These values can be reviewed and changed through the Portal Management page. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Search Server Configuration:

Note: If the Portal Server and Reporting Server are installed on separate machines, in the Search Server configuration the Portal Server field should be set to the name of the Reporting Server for all Canisters. On the Portal Server and Reporting Server themselves, leave this field blank.

Server Name
Recommended Value

Portal Server
leave blank

Data Service
current machine name (not `localhost`)

Alert Server
If this value is not specified, then the Portal Server location is used.

These values can be reviewed and changed through Search Server configuration. See “Configuring the Search Server” on page 107.

Canister(s): Search Server Configuration:

Server Name
Recommended Value

Portal Server
Portal Machine name

Data Service
Portal Machine name

- These values can be reviewed and changed through Search Server configuration. See “Configuring the Search Server” on page 107.

Deployment - Multi-Server with Portal and Report Server on Different Machines: In most deployments, the Portal application and the Report Server are installed on the same machine. However, during initial installation, you can choose to install these two components on different machines.

- If the Report Server is installed on a separate machine, then the setting for Search Server Alias must point to the Report Machine, especially for the Portal machine.

Portal Machine: Portal Management Page:

Server Name
Recommended Value

Report Server
Report Machine name

Data Service
Report Machine name

These values can be reviewed and changed through the Portal Management page. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Search Server Configuration:

Server Name
Recommended Value

Portal Server
leave blank

Data Service
Report Machine name

- These values can be reviewed and changed through Search Server configuration. See “Configuring the Search Server” on page 107.

Report Machine: Search Server Configuration:

Server Name
Recommended Value

Portal Server
leave blank

Data Service
current machine name (not `localhost`)

- These values can be reviewed and changed through Search Server configuration. See “Configuring the Search Server” on page 107.

Canister(s): Search Server Configuration:

Server Name
Recommended Value

Portal Server
Report Machine name

Data Service
Report Machine name

- These values can be reviewed and changed through Search Server configuration. See “Configuring the Search Server” on page 107.

Alert Service: The Portal assumes the machine configured to be the Report Server in the Portal is where the Alert Service is running. The Alert Service needs to be running on that machine.

- See “Configuring the Alert Service” on page 141.

Add Servers

If there are other Tealeaf servers in the environment, the Portal must be made aware of them. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Tealeaf Data Service

The Tealeaf Data Service brokers connections between Tealeaf servers and services and the databases they use. Depending on your deployment, you may need to configure the Tealeaf Data Service references in Search Server configuration.

- See "Configuring the Tealeaf Data Service" in the *IBM Tealeaf CX Configuration Manual*.
- For more information on configuring Search Server, see “Configuring the Search Server” on page 107.

CX User Administration

Configuring cxImpact Users and Groups

After you have configured application settings, you can configure IBM Tealeaf cxImpact user and group settings. To review the IBM TealeafcxImpact users who are currently logged in, click the Current Users link in the left navigation pane of the Portal Management page. See "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.

For IBM Tealeaf cxImpact users, permissions are defined as the superset of all permissions for groups of which they are members. The group level settings for IBM Tealeaf cxImpact users are inherited from the user's primary group. When defining permissions for IBM TealeafcxImpact users, you should first assign them at the group level and then make adjustments for individual users. When IBM TealeafcxImpact is installed, two user groups are automatically created:

- `Admin Group` - IBM Tealeaf cxImpact administrators.
  - `ADMIN` - default IBM Tealeaf cxImpact administrator account.
- `Portal User` - IBM Tealeaf cxImpact users.
  - No default Portal user account is created.

Configuring ADMIN account: The ADMIN account is the master account for the Tealeaf Portal. Before you configure other accounts in the system, you should configure this account.

- To configure the ADMIN account, click the IBM Tealeaf CX User Administration link in the left navigation panel. Click **Users**. Then, select ADMIN. The account settings are displayed. Review the following items:

  Setting Description

  Username
  By default, this account username is set to ADMIN.

  Note: Renaming this account is not permitted.

  NT Username
  If you are using NT authentication, enter the NT domain username for this account.
  – For more information on NT Authentication, see "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

  NT Domain
  If you are using NT authentication, enter the NT domain for this account.
  – For more information on NT Authentication, see "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

  Email Enter a valid email address for the Tealeaf administrator who manages IBM Tealeaf cxImpact.

  Time Zone (used in Search)
  Select the administrator's preferred time zone. When viewing session data, the date and time information is converted to the configure time zone.

  This setting defaults to the **Primary Group Default**. The administrator can then make adjustments to this setting by selecting from the time zones.

  System Locale
  Select the preferred system locale setting to configure the Tealeaf Portal to use the regional locale settings for the administrator user. The system locale setting defines how currency, numeric values, date, and time are formatted and displayed.

  This setting defaults to the **Primary Group Default** at the user level. The administrator can then make adjustments to this setting by selecting from the available system locales.

  Date Format
  Select the format, such as mm/dd/yyyy, from the drop-down list.

  At the user level, the administrator's date format defaults to the **Primary Group Default** that would be the Admin Group's date format. At the group level, the Admin Group's date format defaults to the date format of the system locale that admin group selects. However, the administrator user can change date format from **Primary Group Default** to **Use system locale (default)** to apply the selected System Locale settings to the date format. You can also select a specific date format from the list of available formats.

Portal Navigation Menu
This account should have access to all Tealeaf Portal menu items. You can leave the default value.

Primary User Group
This account should have its primary user group set to Admin Group, which is the default value.

Change ADMIN password: It is recommended that you change the password on the ADMIN account at this time. Select the ADMIN account and click **Password**. Enter the new password twice and click **Save**.

Configuring Groups: Initially, these two groups have the same permissions, except for the default start page. IBM Tealeaf cxImpact Admin users start on the Portal Management page by default, while IBM Tealeaf cxImpact Users start on the default search template page.

For each group, you should review the following settings at a minimum:

Setting Description

Default Password Expiration
The number of days that a password is allowed to be used before all members of the group must choose a new one.

Password Expiration Warning Period
The number of days prior to password expiration that a user begins to receive Portal warning messages to change it before it expires.

Default Portal Navigation Menu
If set to Disable, members of this group cannot see the top-level Portal navigation menu and can access only Portal pages available through their defined default page.

Default Log User Out If Idle
If set to Enable, members of this group are automatically logged out of the Portal if their accounts are idle for a specified period of time.

- You can change the idle timeout setting. See "Configuring the Report Server" on page 58.

Default Lock Replay Mode
If set to Disable, members of this group cannot change their Replay Mode.

Default Replay Mode
Defines the replay mode for the group. If members of this group are not provided the IBM Tealeaf CX RealiTea Viewer application, set this value to BBR, which is a web-based replay application.

Default Search Template
You can select the default search template to display to members of this group from the drop-down.

Additionally, you should review the options available by selecting each of the following buttons at the top of the settings pane:

- **Assign Users** - To assign a user to the selected group, click the Assigned checkbox and click **Save**.
- **Menu Profile** - Make selections in the menu tree to define the pages to which members of this group can access. The default settings for IBM Tealeaf cxImpact groups should provide adequate access.

Note: By default, the IBM Tealeaf cxImpact Admin group has additional menu permissions to see monitoring reports, such as Activity Reports and Active Status, which may be used to verify system status and to diagnose problems reported by user group members.

- **Administration Profile** - You can select the areas of the Portal Management page to which the group members have access.

  Note: The group must have the Portal Management page in its menu profile. Access to these areas should be reserved for administrator groups.
- **Search Profile** - The Search Profile defines the options available to the members of this group on the Search page, as well as the specific search templates that they can access.
- **Browser Replay Profile** - For groups with access to Browser-Based Replay, this profile controls the actions and permissions available to group members when using BBR.

After you have configured group-level settings, you can make adjustments to individual user accounts. To see the user settings, click the Users link in the left navigation pane under IBM Tealeaf CX User Administration.

- See "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.

Report Configuration

You can also define and configure reports for use in the system.

- For more information on configuring reports, see "Report Configuration" in the *IBM Tealeaf cxImpact Administration Manual*.
- **Scorecards** are used to report in graphical or tabular format useful metrics on data captured by Tealeaf. For more information on configuring scorecards, see "Configuring Scorecards" in the *IBM Tealeaf cxView User Manual*.
- **Dashboards** can be used to arrange multiple reporting components into a single page. For more information on configuring dashboards, see "Configuring Dashboards" in the *IBM Tealeaf cxView User Manual*.
- **Tealeaf Status report** delivers status information on the components of the Tealeaf system. For more information on configuring the Tealeaf Status report, see "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*.
- **Search and List Templates** can be configured to enable specific search fields for specified groups. For more information on configuring search templates, see "Configuring Search Templates" in the *IBM Tealeaf cxImpact Administration Manual*.

Note: If the number of days to retain hourly event reporting data is changed, the reports might not display current data until the system normalizes.

Testing Your Configuration

After you have completed your initial configuration, you can perform the following steps to verify the configuration. A more complete set of tests can be executed after all Tealeaf components have been configured. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

1. **Test a IBM Tealeaf cxImpact User Account:** After you have configured user and group settings, you should create a sample user for each group and test menu access, its default search template, and replay features.
   a. Check an account that is a basic Portal user.

b. Try to search for session data. See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.
   - If you cannot complete a search, there may be issues with your authentication configuration. See "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

c. For more information on replay through the Portal, see "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual*.

2. **Login under** `ADMIN`**:** You should verify that the `ADMIN` account is properly configured.
   a. Log in using this account and check to see that all menu items are available.
   b. If you have configured Portal announcements, select **Help** > **Portal Announcements**.
   c. If you have configured the Tealeaf administrator, select **Help** > **Contact Tealeaf Administrator**.
3. **Run Portal Tests:**
   a. From the Portal menu, select **Help** > **About IBM Tealeaf CX Portal**.
   b. In the Portal Performance Tests panel, click the Execute All link.
   c. When the tests are completed, a `Success` message or a time value should be displayed in the Results column. These messages indicate that the Portal is operational and able to communicate with its required component frameworks and the Tealeaf database.
4. **Generate Tealeaf Status Report:** The Tealeaf Status report can be configured to provide useful status information from Tealeaf databases, servers, and components, including the IBM Tealeaf CX Passive Capture Application. Through the Portal, you can generate one of these reports.
   a. To execute the Tealeaf Status, select **Help** > **Portal Management**.
   b. In the Portal Management page, click the Logs section in the left navigation panel.
   c. Under the Logs heading, click the View Tealeaf Status link.
   d. The Tealeaf Status report is generated in the Portal.
   e. Review the generated report for error or warning conditions.
5. **Review Logs:**
   a. In the Portal Management page under the Logs heading, you can bundle the Tealeaf logs together into a `.ZIP` file for external review. Click the Tealeaf Logs and Configuration Files link. Save the file locally.
   b. Review each of the zipped log files for `Error` entries.
6. **Verify Tealeaf Servers:**
   a. In the Portal menu, select **Tealeaf** > **Portal Management**.
   b. Under Tealeaf Servers, click the Manage Servers link.
   c. Review the list of available servers. For each server, use the buttons in the toolbar to complete the following:
      1) Ping the server.
      2) Review the Windows Event Log.
      3) Review the Tealeaf Logs.
   d. You should display inactive servers to verify that none of the listed ones should be active.

When all Tealeaf components are configured, you should complete an end-to-end test. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

Initial TMS Configuration

Note: This section provides a framework for performing the initial configuration of one component of the IBM Tealeaf CX system in a simplified deployment model. Depending on your Tealeaf solution's deployment, extra configuration may be required. If you have any questions about configuration, contact http://support.tealeaf.com.

The Tealeaf Management System provides a single, central point from which you can manage all Tealeaf servers, components, and their configurations. Through TMS, you define properties for individual Tealeaf components and then schedule and execute jobs to push those configuration changes to all dependent servers.

- See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Through TMS, you can define, configure, and monitor the Windows pipelines that process hit data forwarded from the IBM Tealeaf CX Passive Capture Application to your Processing Servers for reporting purposes.

- For more information about defining and configuring Windows pipelines, see "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
- For more information about monitoring Windows pipelines, see "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

TMS also provides the means of managing your Tealeaf database, including backup and import, as well as exporting XML configuration reports on the contents of TMS.

- See "TMS Advanced Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

This section provides a sequence of tasks to perform the initial configuration of the Tealeaf Management System. Read the sections in the listed order to complete the necessary steps to get TMS up and running.

Example Architecture

This section assumes the following deployment for your Tealeaf solution. Depending on your Tealeaf deployment, additional configuration may be required.

- 1 PCA Server - The IBM Tealeaf CX Passive Capture Application manages the capture of requests and responses forwarded from your web application and assembles them into meaningful session data for use by the rest of the Tealeaf system.

  Note: Before you complete the TMS configuration, you should have already installed and configured at least one instance of the IBM Tealeaf CX Passive Capture Application on a separate Linux server. See "Initial PCA Configuration" in the *IBM Tealeaf Passive Capture Application Manual*.
- 1 HBR Server - Health-Based Routing (HBR) managing load balancing and failover in Tealeaf environments that include multiple canister servers. For purposes of this initial configuration, it is assumed that HBR has been deployed in your Windows pipeline and properly configured. For more information on HBR, see “Health-Based Routing (HBR) Session Agent” on page 263.
- 2 Canister Servers - These Canister Servers (or Processing Servers) perform the essential processing of hits received to them and writes them to disk for indexing and ultimately search.

- 1 Reporting Server - The Reporting Server consists of the Portal Web Interface, the Data Server, and the IBM Tealeaf CX databases.

  Note: TMS is typically installed and hosted on the Reporting Server.

Pre-Requisites

1. It is assumed that all Tealeaf software has been installed on Windows and Linux servers. Before you begin, please complete all software installation first. See "CX Installation" in the *IBM Tealeaf CX Installation Manual*.
2. Additionally, you should have already performed the initial configuration steps for the IBM Tealeaf CX product components. See Chapter 1, “Overview of CX Configuration,” on page 1.

TMS Pre-Requisites

Before you begin configuring TMS, you should complete the following steps:

1. Get latest build of TMS for your Tealeaf version.
   - Tealeaf software can be downloaded. For more information on downloading Tealeaf software, see Tealeaf CX Downloads.
2. Assign the TMS master server.

   Note: In almost all deployments, the TMS master server should be Portal Server, unless there is a compelling reason to assign it to another server.

Initializing TMS

Configuration files such as `TealeafCaptureSocket.cfg` are available within the Tealeaf install directory. If changes are made outside of TMS, you may be prompted of these external changes when you try to edit the associated configuration inside TMS.

Note: Avoid editing Windows configuration files directly.

First Startup

When TMS is started for the first time, the following steps are performed.

1. **TMS master server:**
   a. TMS Datastore is created.
   b. Data dictionary is loaded from `TMSManifest.dll`.
   c. TMS performs a discovery of components & configurations on the TMS master server.
   d. TMS master server starts listening for requests.
2. **All TMS slave servers:**
   a. TMS slave servers attempt to contact the TMS master.
   b. If the connection attempt fails:
      1) The connection is retried every 10 seconds.
      2) An error is logged every 5 minutes until the connection is successful.
   c. TMS Datastore is created.
   d. Slave server requests data from the TMS master server.
   e. TMS performs a discovery of components & configurations on the TMS slave server. Newly discovered items are forwarded to the TMS master for updating.
   f. Slave server begins listening for requests.

Subsequent Startups

After the first time TMS is started, subsequent starts or restarts of TMS result in the following steps:

1. **TMS master server:**
   a. TMS master server checks `TMSManifest.dll` for data dictionary updates.
   b. TMS performs a discovery of components & configurations on the TMS master server.
   c. TMS master server starts listening for requests.
2. **All TMS slave servers:**
   a. TMS slave servers attempt to contact the TMS master.
   b. If the connection attempt fails:
      1) The connection is retried every 10 seconds.
      2) An error is logged every 5 minutes until the connection is successful.
   c. TMS Datastore is created.
   d. Slave server requests data from the TMS master server.
   e. TMS performs a discovery of components & configurations on the TMS slave server. Newly discovered items are forwarded to the TMS master for updating.
   f. Slave server begins listening for requests.

TMS Settings

When the Portal becomes available, you should login to the Portal and configure the TMS Master server.

• See “Initial Portal Configuration” on page 160.

1. Login to the Tealeaf Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **TMS**.
3. In the Server view, click the Tealeaf Management Server node.
4. Click **Tealeaf Management Server configuration**.
5. In the Config Actions pane, click **View/Edit**.
6. The Tealeaf Management Server configuration is displayed:

Table 4. TMS Settings

Field	Description	Required Value
`Days to Keep Notifications`	Number of days to retain notification messages.	Retain default value for now
`Log Level`	The log level for writing messages to the TMS log.	Retain default value for now
`Master Port`	Port number for the TMS master server to use. For more information ports used by Tealeaf, see "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*.	Default setting is `20000`. Change this value only if required.

Table 4. TMS Settings (continued)

Field	Description	Required Value
`Master Server`	Enter the name of the server that is the TMS master. **Note:** When specifying the TMS master server on TMS slave servers, use the DNS-resolvable machine name, which can be acquired by running the `hostname` command from the Windows command line.	Specify the machine name. If the TMS Master is installed on the Portal Server, use `localhost`. **Note:** Unless there is a strong reason to do otherwise, the Portal Server should always be the TMS master. Using a different server as TMS master may require additional configuration and extra processing. **Note:** It is recommended that you install on the TMS Server first and launch the TMS server. If it is on the Portal Server, it is not required that you start the Portal. You can install and start other servers first; these servers poll for the TMS master server until it comes online.

For more information on these settings, see "TMS Administration" in the *IBM Tealeaf cxImpact Administration Manual*.

Defining Event Master

Through TMS, you can specify the Tealeaf server that is the event master server for event slave servers. The event master server maintains the copy of record for Tealeaf event definitions, changes to which are published to the event slave servers.

- The Event master is specified through the Search Server configuration. See "Configuring the Search Server" on page 107.

1. Login to the Tealeaf Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **TMS**.
3. In the WorldView, select Servers from the drop-down.
4. For each listed server that is not the event master server:
   a. In the Server view, click the Search Server node.
   b. Click **Search Server configuration**.
   c. In the Config Actions pane, click **View/Edit**.
   d. The Search Server configuration is displayed.
   e. Click the Event Master Server item.
   f. Enter the machine name for the event master server.
   g. Click **Apply**.
   h. Click **Save**.
5. Repeat the above configuration steps for each event slave server in the Tealeaf environment.
   - See "Configuring the Search Server" on page 107.

Adding New Servers

When a new server is added to the Tealeaf system, it automatically registers itself with the TMS Master and uploads its configuration data.

Configuration Management

You can now configure TMS to manage your Tealeaf configurations across all Tealeaf components in your environment.

Using Keywords

You can assign keywords to specific configurations and then filter the WorldView display to show only those items that share the same keyword. For example, you could assign the keyword `SearchServer` for the Search Server configuration across all Tealeaf servers. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Sharing Configurations

Through TMS, you can specify TMS items on different servers to share the same configuration.

1. In TMS WorldView, select the item to share a configuration.
2. In the Config Actions pane, click **Assign (share)**.
3. In the dialog, select the items to share the same configuration.
4. Click **Assign**.
5. The next time a push configuration job is executed, all servers are updated with the latest shared configuration from the TMS master. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Scheduling Jobs

Through the TMS Jobs tab, you can schedule the execution of jobs whose actions you specify. These jobs can be push or assign a configuration, stop or start or restart a component, and more. See "TMS Jobs Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Pushing Configurations: After you have specified all of the components that are to share configurations, you can configure a job to push configurations to dependent servers and components.

Managing Revisions

In the TMS WorldView tab, you can manage revisions to configurations for each displayed configuration.

To access an earlier configuration version:

1. In the TMS WorldView tab, select the configuration that has an earlier version you wish to review.
2. In the Config Info panel, select the desired version from the Versions drop-down.
3. Click **View/Edit**.
4. The older version of the configuration is displayed.

   Note: If you save the configuration, it is saved as a new version for the selected server. You must specify a Push Configuration job to make the saved version active on the server(s).

For more information on revisions, see "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Update Tasks

Depending on your Tealeaf solution, you may be required to complete some or all of the following tasks on a regular basis through TMS.

Editing Privacy through TMS

Tealeaf privacy enables the removal or masking of sensitive customer data that is part of the web transaction stream. For more information on how Tealeaf manages privacy, see "Managing Data Privacy in Tealeaf CX" in the *IBM Tealeaf CX Installation Manual*.

In general, it is recommended that you apply privacy rules through the IBM Tealeaf CX Passive Capture Application. However, depending on the volume of web traffic, you may need to move some privacy filtering into the Windows pipeline.

For more information on PCA privacy, see "PCA Web Console - Rules Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

As your web application changes over time, you may need to update the privacy rules that are applied to session data passing through the Windows pipeline. The following steps provide a general approach to managing privacy updates through TMS.

Note: Privacy rules should be developed on production data. Instead, you should use the standalone Privacy tester utility to iterate on your privacy rules before you use TMS to deploy them into the production data stream. See “Privacy Tester Utility” on page 390.

When you are ready to deploy privacy rules modifications to the production transaction stream, please complete the following steps:

1. In the TMS WorldView tab, select the Transport Service node.
2. If you have not yet added the Privacy or Privacy session agent to your pipeline, you can do so now. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
3. To edit privacy rules for an existing session, agent, under the Transport Service node, click **Privacy Filter configuration**.
4. In the Config Actions pane, click **View/Edit**.
5. The Privacy Filter configuration dialog is displayed in which you can create or edit the rules, tests, and actions to apply to transactional data being passed through the privacy filter in the Windows pipeline. For documentation on privacy rules, see “Privacy Session Agent” on page 291 and “Extended Privacy Session Agent” on page 261.
6. To save changes, click **Save**.
7. Define a Push Configuration job to assign the configuration changes to any other Processing Servers in the Tealeaf environment. See "TMS Jobs Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Updating License Key

As you upgrade or license new Tealeaf components, you may be required to enter a new license key. The following steps can be used to change the license key through TMS without having to login to the Portal server.

1. In TMS WorldView, click the Tealeaf node.
2. Click **Shared Configuration information**.

3. In the Config Actions pane, click **View/Edit**.
4. The Report Server configuration is displayed. Click the Portal tab.
   - See “Configuring the Report Server” on page 58.
5. Click the Portal License Key entry.
6. Enter the new license key provided to you by Tealeaf http://support.tealeaf.com.
7. To save the new license key, click **Save**.
8. In the TMS Job tab, configure a new job with the following actions:
   a. A Push Configuration job to assign the configuration to the machine hosting the Portal Server
   b. A Restart Component job to restart the Portal Server after the assignment has been executed. This job performs an IIS Restart on the server.
   - See "TMS Jobs Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Testing Your Configuration

When all Tealeaf components are configured, you should complete an end-to-end test. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

IBM Digital Analytics Integration Solution

IBM Tealeaf supports integration with IBM Digital Analytics. By integrating IBM Tealeaf and IBM Digital Analytics you enable access to Tealeaf session data and session replays from reports that are generated by IBM Digital Analytics.

IBM Digital Analytics removes barriers for going from analytics to action so marketers can increase revenues by targeting prospective customers with relevant content across digital channels. IBM Digital Analytics helps marketers increase visitor acquisition and retention rates, improve multichannel strategy formation and implementation, and optimize budget allocation and marketing mix, including email marketing, mobile marketing, display advertising, and social media marketing. For more information about IBM Digital Analytics, visit http://www.ibm.com/software.

IBM Digital Analytics integration solution overview

The segment file integration method is used to automate the creation of a Tealeaf session segment that corresponds to a segment defined in IBM Digital Analytics.

The integration is accomplished by supplying a data file that contains a list of values that identify unique customer sessions to the configured Tealeaf Segment Builder. For more information about the segment builder, see "Segment Builder Service" in the *IBM Tealeaf cxConnect for Web Analytics Administration Manual*.

For the IBM Digital Analytics integration solution, IBM Digital Analytics provides a data file which is read by Tealeaf. Tealeaf uses this data to format and return session information back to IBM Digital Analytics. The integration enables you to create session reports in Tealeaf and then push the data to IBM Digital Analytics. Once the data is pushed to IBM Digital Analytics, the user can generate reports in IBM Digital Analytics that provide links to Tealeaf session data and replays.

Configuring IBM Tealeaf for IBM Digital Analytics integration

Note: Before you configure IBM Tealeaf for integration with IBM Digital Analytics, create a shared folder on an FTP server. Both applications use the folder to read and write data that is shared between the applications.

To enable IBM Digital Analytics integration in IBM Tealeaf:

1. Create a user account and a shared folder on an FTP Server where IBM Tealeaf and IBM Digital Analytics can read and write data files.
2. Configure the IBM Tealeaf CX Settings for integration with IBM Digital Analytics. by navigating to the Tealeaf Portal, then clicking **CX Settings** > **Integration**. For more information on configuring the integration settings, see "CX Settings" and "Integration" in the *IBM Tealeaf cxImpact Administration Manual*.
   a. Open the Tealeaf Portal.
   b. Click **CX Settings** > **Integration**.

      Note: Click **Save** each time you enter a value for a setting. If you do not click **Save**, the value will be lost when you click another setting.
   c. Edit each of the IBM Digital Analytics settings by clicking on the setting; then, enter the value for the setting and click **Save**.

      Note: The values for the FTP settings use the same user account settings that were created in step 1.

Additional configuration is required in IBM Digital Analytics. For more information on configuring IBM Digital Analytics to integrate with IBM Tealeaf, see the documentation that comes with IBM Digital Analytics.

After you have configured IBM Tealeaf for IBM Digital Analytics integration, you can export session searches to IBM Digital Analytics. For more information on creating and exporting session searches, see "cxReveal - Searching for Sessions" and "Exporting Search Results" in the *IBM Tealeaf cxReveal User Manual*.

Data collection for IBM Digital Analytics

Tealeaf creates a data file that holds the session information and metadata for the segment. This file is saved to the FTP server that was defined when the integration settings for IBM Digital Analytics. For more information on configuring the integration settings for IBM Digital Analytics , see “Configuring IBM Tealeaf for IBM Digital Analytics integration.”

The data file contains the following data that can be read by IBM Digital Analytics:

- The name of the segment.
- The email address that is used for notification when the session IDs for the Tealeaf segment are sent to the FTP server and are available for use in IBM Digital Analytics.
- ID of each Tealeaf customer session.
- The first and last time stamps of each session.

For an example of the Tealeaf data file that is exported for IBM Digital Analytics, see “ IBM Digital Analytics data examples” on page 177.

IBM Digital Analytics data examples

Segment File example

The following is an example of the data that Tealeaf exports for IBM Digital Analytics.

```
TL_SESSION_ID,TL_START_TS,TL_END_TS
43F23716C901C5AAD4D31521503DBE10,1363756101,1363756766
5DD66F4484F4FABD751F8B9416259797,1363760019,1363760443
261FE68588637CDA80BEA928EC865BD1,1363756600,1363756916
F895E4DD56AB0AA0AF7C95DAD85C14CC,1363758338,1363758338
42699EC62F5A27D7D96211BC70476377,1363757469,1363757469
4FB3E23822EEE2CFC2FE4D6D27A52C67,1363759653,1363759888
AA7786F92731D854477D6E3BA45C7E58,1363760287,1363760699
21B6D808ABCDDF94E46C4A6FE55A2801,1363756869,1363757280
```

Initial cxConnect configuration

It is necessary to perform configurations of your IBM Tealeaf CX deployment. Depending on your Tealeaf solution deployment, more configuration might be necessary.

Note: This section provides a framework for performing the initial configuration of one component of the IBM Tealeaf CX system in a simplified deployment model. Depending on your Tealeaf solution's deployment, more configuration may be required. If you have questions about configuration, contact http://support.tealeaf.com.

Tealeaf IBM Tealeaf cxConnect for Data Analysis provides you with the ability to analyze and report on data that is captured by Tealeaf-captured data within various third-party solutions, including custom reporting tools and databases, warehouses, business intelligence environments, and web analytics products. Additionally, IBM Tealeaf cxConnect for Data Analysis enables the creation of a persistent store of session data from your web applications.

Note: IBM Tealeaf cxConnect for Data Analysis is a separately licensable component of the IBM Tealeaf CX system. please contact your IBM Tealeaf representative.

This page describes how to perform the initial configuration of IBM Tealeaf cxConnect for Data Analysis.

- For more information about IBM Tealeaf cxConnect for Data Analysis, see "cxConnect for Data Analysis Administration Manual" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

Prerequisites

Certain prerequisites are required to perform the initial configuration of IBM Tealeaf cxConnect.

- It is assumed that all Tealeaf software was installed on Windows and Linux servers. Before you begin, complete all software installation first. See "CX Installation" in the *IBM Tealeaf CX Installation Manual*.
- Additionally, you should already perform the initial configuration steps for the IBM Tealeaf cxImpact product components. See "Overview of CX Configuration" in the *IBM Tealeaf CX Configuration Manual*.

cxConnect installation

Before you begin, IBM Tealeaf cxConnect for Data Analysis must be installed through the separate installation program. See "cxConnect Installation" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

Adding cxConnect server

IBM Tealeaf cxConnect for Data Analysis requires its own Tealeaf server to manage extraction and data output.

1. Log in to the Tealeaf Portal as an administrator.
2. From the **Portal** menu, select **Tealeaf** > **Portal Management**.
3. The Portal Management page appears.
4. In the left navigation pane, click **Tealeaf Servers**.
5. Click the **Manage Servers** link. The list of currently available Tealeaf servers is displayed.
6. If a IBM Tealeaf cxConnect for Data Analysis server does not exist, click **New**. Select **CxConnect Server** from the drop-down menu. If a IBM Tealeaf cxConnect for Data Analysis server exists, select it and click **Edit**.
7. Edit the IBM Tealeaf cxConnect for Data Analysis Server properties.
   a. Click the **Active** check box.
   b. Enter the display name for the server. The default value `cxConnect Server` is recommended.
   c. From the drop-down, select the server that is hosting the IBM Tealeaf cxConnect for Data Analysis Server.
   d. Enter the port number to use. The default value for IBM Tealeaf cxConnect for Data Analysis is `19000`.
   e. Click **Save**.
8. The server is added to the list. See "Managing Tealeaf Servers" in the *IBM Tealeaf cxImpact Administration Manual*.

Adding a configured task

Now that the IBM Tealeaf cxConnect for Data Analysis software was installed and the IBM Tealeaf cxConnect for Data Analysis server was configured, you can create your first IBM Tealeaf cxConnect for Data Analysis task.

- For more information about configuring IBM Tealeaf cxConnect for Data Analysis tasks, see "cxConnect Configuring Tasks" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

The steps below outline how to create a simple IBM Tealeaf cxConnect for Data Analysis Data Files task. The Data Files method of export extracts selected Tealeaf sessions into a flat-file text format. These sessions can then be inserted into your enterprise system of choice.

Note: The Data Files method of export is the recommended Tealeaf integration method.

1. Log in to the Tealeaf Portal as an administrator.
2. From the **Portal** menu, select **Tealeaf** > **IBM Tealeaf cxConnect for Data Analysis**.
3. The IBM Tealeaf cxConnect for Data Analysis page is displayed. The list of scheduled tasks is displayed.
4. In the left navigation pane, click **Configured Tasks**.

5. Then, click the + sign.
6. The following sections describe the properties in each tab of the configured task that must be populated.

General tab

You can review session data by selecting a time period between Extract From and Extract To values to define a time period of session data that you would like to review.

1. Click the **General** tab.
2. Enter a value for the task Name. For example, `test_task`.
3. For Scheduling, click **Run Now**.
4. For the Extract parameters, enter a time period when you know that session data was generated.
   - For testing purposes, limit yourself to a one-hour period. Do not overlap dates for this test.
   - To specify a date, click in one of the date fields. Use the calendar tool to select a date.
   - To specify a time value, click in one of the time fields. Use the arrow keys or enter the value from the keyboard. To set the time value, click **Set**.
   - Verify that your Extract From and Extract To values define a one-hour period that occurs some time in the past when session data is likely to be captured.
5. Select the **Active** check box.

CX Servers tab

1. Click the **IBM Tealeaf CX Servers** tab.
2. Click the check box next to the server from which you want to extract sessions.
   - If multiple servers are listed, select only a single server.

Data Set tab

For this test, skip the **Data Set** tab.

Data Filters tab

For this test, skip the **Data Filters** tab.

Destination tab

1. Click the **Destination** tab.
2. Select the **Data Files** option. The following options appear.
   a. Select the **Active** check box.
   b. If needed, specify the Exported Data Directory value. This directory should be accessible to you on the IBM Tealeaf cxConnect for Data Analysis Server.
   c. For this test, set the Number of Concurrent Exports to 1.

Notification tab

1. Click the **Notification** tab.
2. Click **To**.
3. Enter your email address in the space provided.

Save task

After you completed the above steps in each IBM Tealeaf cxConnect for Data Analysis tab, click **Save**. The task is saved.

Checking task status

Since the task was specified to run immediately, IBM Tealeaf cxConnect for Data Analysis begins processing it as soon as possible. You can complete the following steps to verify task status.

Note: Since you configured the task to notify your email address, you can wait for the email to be delivered to you. However, if there is a configuration issue with the mail settings, use IBM Tealeaf cxConnect for Data Analysis to monitor job status this time.

1. In the IBM Tealeaf cxConnect for Data Analysis left navigation pane, click **Scheduled Tasks**.
2. The job is displayed in the list of scheduled tasks. Look for the friendly Name you specified in the General tab in the list.
3. In the **Information** column, you can monitor the progress of the task completion.
   - To refresh the display that includes the **Information** column, click **Refresh**.
   - When the **Information** column field value concludes with `Processed`, IBM Tealeaf cxConnect for Data Analysis completed the task.
4. The notification email arrives shortly. It contains the extraction log for the task, which can be useful in resolving issues.

Verify output in destination directory

After the task was processed, you can verify that the output files were generated in the destination directory on the IBM Tealeaf cxConnect for Data Analysis server.

In the specified output directory, files similar to the following should be generated:

```
BulkAppData.20090925_120000_20090925_115959.test_task_30_1253917972.9480_1.dat
BulkAttrb.20090925_120000_20090925_115959.test_task_30_1253917972.9480_1.dat
BulkEvent.20090925_120000_20090925_115959.test_task_30_1253917972.9480_1.dat
BulkHit.20090925_100000_20090925_105959.test-spo_40_1253918431.9528_1.dat
BulkSesn.20090925_120000_20090925_115959.test_task_30_1253917972.9480_1.dat
BulkUrlField.20090925_120000_20090925_115959.test_task_30_1253917972.9480_1.dat
```

For more information about the schema of these files, see "cxConnect Configuring Tasks" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

Integration with enterprise databases

These files are ready for integration with the destination enterprise database. Tealeaf provides a set of sample scripts that can be modified to complete this integration step. See "cxConnect Configuring Tasks" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

Other configuration options

In addition to the Data Files method of output, IBM Tealeaf cxConnect for Data Analysis provides the following output options:

- **Log files** - Extract sessions into W3C-compliant log files. See "cxConnect Configuring Tasks" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

Testing your configuration

After you completed your initial configuration, you can perform the following steps to verify the configuration.

If you completed the initial test configuration in the preceding steps, you can verify IBM Tealeaf cxConnect for Data Analysis operations by examining the results in the output directory, if you did not do so already.

- See “Verify output in destination directory” on page 180.

When all Tealeaf components are configured, complete an end-to-end test. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

References

For more information about IBM Tealeaf cxConnect for Data Analysis, see "cxConnect for Data Analysis Administration Manual" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

- For more information about configuring tasks, see "cxConnect Configuring Tasks" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.
- For more information about scheduling tasks, see "cxConnect Scheduling Tasks" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

For another example integration that uses the Data Files method, see "cxConnect Configuring Tasks" in the *IBM Tealeaf cxConnect for Data Analysis Administration Manual*.

Initial IBM Tealeaf cxVerify Configuration

Note: Following is a framework for configuring one component of the IBM Tealeaf CX system in a simplified deployment model. Depending on your deployment, more configuration might be required. If you have any questions about configuration, contact http://support.tealeaf.com.

IBM Tealeaf cxVerify generates an accurate record of each visitor's interactions with your website. At scheduled intervals, IBM Tealeaf cxVerify stores captured session data in a persistent datastore from which you can later retrieve and replay it.

Note: IBM Tealeaf cxVerify is a separately licensable component of the IBM Tealeaf CX system. IBM Tealeaf cxVerify is no longer available as a newly licensed product as of Release 8.7. Customers that licensed IBM Tealeaf cxVerify in Release 8.6 and earlier can continue to use and receive support for the product in Release 8.7 and later. For more information, contact Tealeaf Customer Support .

Pre-Requisites

Before you begin, install all IBM Tealeaf software on Windows or Linux servers. For more information, see the *IBM Tealeaf CX Installation Manual*.

In addition, you must first complete the initial configuration steps for IBM Tealeaf cxImpact. For more information, see the *IBM Tealeaf CX Configuration Manual*.

IBM Tealeaf cxVerify Installation

Before you begin, you must install IBM Tealeaf cxVerify.

Types of Archiving

IBM Tealeaf cxVerify supports one type of archiving.

Session File Task: To export session data to a PDF, configure a Session File Task to deliver the session data files to a IBM Tealeaf cxVerify server. For each exported

session, a PDF file is generated and can optionally include logging information and a link to replay the session. See “Session File Tasks” on page 183.

Servers

Add a IBM Tealeaf cxVerify Server

The IBM Tealeaf Portal requires a reference to communicate with the IBM Tealeaf cxVerify server. You must create this reference through the Portal Management Page.

Add the Selective Archive Server

Selective Archiving requires its own IBM Tealeafserver, which you create through the Portal Management page. The Selective Archive server is used to archive sessions that are extracted from the Canister.

Archive Tasks

If you are exporting IBM Tealeaf sessions that you still want to access through search and replay, you can configure an Archive task. Archive tasks deliver a user-configurable set of sessions to a selective archive at regularly scheduled times.

Create the New Selective Archive

On the server where you intend to store your sessions, you must create a new Selective Archive.

Adding a Configured Task

Now that the IBM Tealeaf cxVerify server is configured, you can create your first IBM Tealeaf cxVerify task. The following steps show how to create a simple IBM Tealeaf cxVerify Session File task.

1. Log in to the IBM Tealeaf Portal as an administrator.
2. From the **Portal** menu, select **Tealeaf** > **IBM Tealeaf cxVerify**.

   The IBM Tealeaf cxVerify page opens and displays the list of scheduled tasks.
3. In the left navigation pane, click **Configured Tasks**.
4. Click the + sign.

The following sections describe the properties in each tab of the configured task that must be populated.

Editing the General Tab

1. Click the **General** tab.
2. Enter a value for the task Name.

   For example, enter `test_task`.
3. For Scheduling, click **Run Now**.
4. For the **`Extract`** parameters, enter a time period when you know that session data was generated.
   - For testing purposes, limit yourself to a one-hour period. Do not overlap dates for this test.
   - To specify a date, click in one of the date fields. Use the calendar tool to select a date.
   - To specify a time value, click in one of the time fields. Use the arrow keys or enter the value from the keyboard. To set the time value, click **Set**.
   - Verify that **`Extract From`** and **`Extract To`** values define a one-hour period that occurred some time in the past when session data was likely captured.

5. Check the **Active** check box.

Editing the CX Servers Tab

1. Click the **IBM Tealeaf CX Servers** tab.
2. Click the check box next to the server from which to extract sessions.

   If multiple servers are listed, select only a single server.

Data Set Tab

For this test, skip the **Data Set** tab.

Editing the Destination Tab

1. Click the **Destination** tab.
2. Select the **Selective Archive** option.

   Select one of the options available.

   - The **Active** check box.
   - The Selective Archive to which you are exporting the sessions.

Editing the Notification Tab

1. Click the **Notification** tab.
2. Click **To**.
3. Enter your email address in the space provided.

Next Steps

You can now save the task.

Session File Tasks

If you are delivering individual PDF files for each extracted session, complete the following configuration steps to set up a Session File task.

Adding an cxVerify IBM Tealeaf Server

Session File Export requires a IBM Tealeaf cxVerify Server to manage extraction and data output.

1. Log in to the IBM Tealeaf Portal as an administrator.
2. From the **Portal** menu, select **Tealeaf** > **Portal Management**.

   The Portal Management page opens.
3. In the left navigation pane, click **Tealeaf Servers**.
4. Click the **Manage Servers** link. The list of currently available servers is displayed.

   The list of currently available servers is displayed.
5. If an IBM Tealeaf cxVerify server does not exist, click **New** and select **IBM Tealeaf cxVerify Server** from the menu.
   - If a IBM Tealeaf cxVerify server exists, select it and click **Edit**.
6. Edit the IBM Tealeaf cxVerify Server properties.
   a. Click the **Active** check box.
   b. Enter the **Display Name** for the server.

      The default value is `cxVerify Server`.
   c. From the list, select the server that is hosting the IBM Tealeaf cxVerify Server.
   d. Enter the port number to use.

      The default value is `19000`.

e. Click **Save**.

The server is added to the list.

Editing the General Tab

1. Click the **General** tab.
2. Enter a value for the task Name. For example, `test_task`.
3. For Scheduling, click *Run Now*.
4. For the Extract parameters, enter a time period when you know that session data was generated.
   - For testing purposes, limit yourself to a one-hour period. Do not overlap dates for this test.
   - To specify a date, click in one of the date fields and use the calendar tool to select a date.
   - To specify a time value, click in one of the time fields. Use the arrow keys or enter the value from the keyboard. To set the time value, click **Set**.
   - Verify that your **`Extract From`** and **`Extract To`** values define a one-hour period that occurred when session data was likely captured.
5. Select the **Active** check box.

Editing the IBM Tealeaf CX Servers Tab

1. Click the **IBM Tealeaf CX Servers** tab.
2. Click the check box next to the server from which you want to extract sessions.
   - If multiple servers are listed, select only a single server.

Editing the Data Set Tab

For this test, skip the **Data Set** tab.

Editing the Destination Tab

1. Click the **Destination** tab.
2. Click the **Session Files** link.
   - You can select the **Session Files with Images** option. However, output in this format might take considerably longer.

   a. Select the **Active** check box.

   b. Specify the directory on the IBM Tealeaf cxVerify Server where output PDF files are to be written.

      Ensure that you have access to that directory.

Digital Signature Tab

For this test, skip the Data Signature tab.

PDF Page Fields Tab

For this test, skip the PDF Page Fields tab. The default values are ok.

Notification Tab

1. Click the Notification tab.
2. Click the To button.
3. Enter your email address in the space provided.

Save Task

After you have completed the above steps in each IBM Tealeaf cxVerify tab, click **Save**. The task is saved.

Checking Task Status

Because the task was specified to run immediately, IBM Tealeaf cxVerify begins processing it as soon as possible. Complete the following steps to verify task status.

Note: Because you configured the task to send status to your email address, you can wait for the email to be delivered to you. However, if there is a configuration issue with the mail settings, use IBM Tealeaf cxVerify to monitor job status.

1. In the IBM Tealeaf cxVerify left navigation pane, click **Scheduled Tasks**.

   The job is displayed in the list of scheduled tasks. In the **Information** column, you can monitor the progress of the task completion.

   When the task is complete, the **Information** column field value concludes with **`Processed`**.
2. To refresh the display, click **Refresh**.

The notification email arrives shortly. It contains the extraction log for the task, which can be useful in resolving issues.

Test Your Configuration

After you complete your initial configuration, you can take the following steps to verify the configuration.

Through the sections below, you can check that IBM Tealeaf cxVerify outputted the sessions in the correct location.

A complete set of tests can be run after all IBM Tealeaf components are configured. For more information, see the *IBM Tealeaf CX Configuration Manual*.

Verifying Archive Task

1. Replay one of the saved sessions.

   For more information, see the *IBM Tealeaf RealiTea Viewer User Manual*.
2. Search the archive.

Verifying Session File Task

1. Go to the output directory on the IBM Tealeaf cxVerify Server.

   The number of PDF files should match the number of sessions that are listed in the **Information** column of the Scheduled Tasks page as were processed for your task.
2. To verify output, open a sample of the PDF files.

When all IBM Tealeaf components are configured, complete an end-to-end test. For more information, see the *IBM Tealeaf CX Configuration Manual*.

References

For more information about IBM Tealeaf cxVerify, see "cxVerify Administration Manual" in the *IBM Tealeaf cxVerify Administration Manual*.

- For more information about configuring tasks, see "cxVerify Configuring Tasks" in the *IBM Tealeaf cxVerify Administration Manual*.

- For more information about scheduling tasks, see "cxVerify Scheduling Tasks" in the *IBM Tealeaf cxVerify Administration Manual*.

Initial cxResults Configuration

Note: This section provides a framework for performing the initial configuration of one component of the IBM TealeafCX system in a simplified deployment model. Depending on your Tealeaf solution's deployment, additional configuration may be required. If you have any questions about configuration, please contact http://support.tealeaf.com.

Note: IBM Tealeaf cxResults is no longer available as a newly licensed product as of Release 8.7. Customers that licensed IBM Tealeaf cxResults in Release 8.6 and earlier may continue to use and receive support for the product in Release 8.7 and later. For more information, please contact Tealeaf Customer Support .

IBM Tealeaf cxResults enables the tracking and reporting on a rich repository of data captured from individual visitors to your web site. Through IBM Tealeaf cxResults, you can gather detailed information on visitor characteristics and behavior for deeper understanding of the customer experience.

This page describes how to perform the initial configuration of IBM Tealeaf cxResults.

- For more information on IBM Tealeaf cxResults, see "cxResults User Manual" in the *IBM Tealeaf cxResults User Manual*.

Pre-Requisites

1. It is assumed that all Tealeaf software has been installed on Windows and Linux servers. Before you begin, please complete all software installation first. See "CX Installation" in the *IBM Tealeaf CX Installation Manual*.
2. Additionally, you should have already performed the initial configuration steps for the IBM Tealeaf cxImpact product components. See "Overview of CX Configuration" in the *IBM Tealeaf CX Configuration Manual*.

Verify Visitor Database

This section provides verification steps to ensure that the visitor database is installed and configured properly.

Verify Availability

After you have completed the installation process, you should verify that the Visitor database, which is used by IBM Tealeaf cxResults, has been properly installed and is accessible.

1. Login to the Portal.
2. From the Portal menu, select **Help** > **About IBM Tealeaf CX Portal**.
3. In the Portal Application Information report, locate the Database panel on the left side of the screen.
4. If the IBM Tealeaf cxResults databases have been properly installed, you should see entries for the following:
   - `TL_VISREPORT`
   - `TL_VISSTAGE`
   - See "Portal Application Information Report" in the *IBM Tealeaf cxImpact Administration Manual*.

Verify Server Settings

In the Portal Management page, you can verify the settings for connecting the Visitor server.

1. Login to the Tealeaf Portal as an administrator.
2. From the menu, select **Tealeaf** > **Portal Management**.
3. Click the Manage Servers link.
4. In the displayed list of servers, click the Visitor Report Server.
5. Verify that the server's hostname and port number are appropriate for connection.
6. To test the connection, click the Ping Server icon in the toolbar.
7. You can also verify other settings pertaining to the Visitor Server. See "cxResults Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Data retention settings: For more information on configuring the database data retention settings, see "Data Aggregation and Retention" in the *IBM Tealeaf cxImpact Administration Manual*.

cxImpact settings:
In the IBM Tealeaf cxImpact settings are some parameters that affect IBM Tealeaf cxResults.

1. Login to the Tealeaf Portal as an administrator.
2. From the menu, select **Tealeaf** > **Portal Management**.
3. In the left navigation panel, select **IBM Tealeaf CX Settings**.
   a. Please review all settings with `Visitor` in the name.
   - See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual* section.
   - See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual* section.

   a. Please review all settings with `Session Segment` in the name.
   - See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual* section.

Enabling the Visitor Database Extractor Job

Through the Tealeaf Scheduling Service, you must enable the Visitor Database Extractor job, which scans each active Canister for sessions to add to the Visitor database at regularly scheduled intervals.

Note: Until this job is configured, enabled, and successfully executed, no data is available for Visitor search.

- See "Configuring the Scheduling Service" in the *IBM Tealeaf CX Configuration Manual*.

Configure Visitorization

In order to identify individual visitors, you must define the field in the session data that indicates a unique visitor identifier. Then, this field must be inserted into the proper location in the request so that it may be defined in the Portal as the visitor identifier.

- See "Configuring Visitorization" in the *IBM Tealeaf cxResults Administration Manual*.

cxResults User Administration

See "Managing Users and Groups for cxResults" in the *IBM Tealeaf cxResults Administration Manual*.

Configure Search Templates and Session Lists

For optimal search performance, you may need to design specific search templates to be made available to users. A **search template** defines the fields for which a user with access to the template can access. Designing a search template enables you to provide only the necessary search fields while removing from access unnecessary or sensitive fields.

When a search is executed, the results are displayed in the search results page, which uses a **session list template** to define which fields to display. A session list template can assist users in finding the most relevant information.

Search Field for Visitor ID

When the `TLT_VID` field has been populated with the visitor identifier and inserted into the `[appdata]` section of the request, you may configure a search field that can be used to search for these visitor identifiers in your search templates.

When you configure a search template for Visitor search, you must add a new search field whose keyword is set to `TLTVID`. This keyword automatically searches the appropriate field in the request data for matches to the input string that Tealeaf users provide through the Portal.

- For more information on configuring search templates and session list templates, see "Configuring Search Templates" in the *IBM Tealeaf cxImpact Administration Manual*.
- For more information on selecting the search template for users who can perform visitor searches, see "Managing Users and Groups for cxResults" in the *IBM Tealeaf cxResults Administration Manual*.

Test Search

After you have performed the above configuration steps, you should be able to search for visitors. Use the visitor search template to find visitor identifiers for sessions that you know have been completed.

- See "Searching for Visitors" in the *IBM Tealeaf cxResults User Manual*.

Configure cxResults Session Filtering Events

By default, Tealeaf provides and enables two events to filter out sessions from IBM Tealeaf cxResults. For storage optimization, these events perform the following actions by default.

Event Name
: **Default Behavior**

`cxResults - Include Sessions`
: All sessions with a hit count greater than 1 are included in IBM Tealeaf cxResults.

`cxResults - Exclude Sessions`
: All sessions identified as bot traffic by Tealeaf are excluded from IBM Tealeaf cxResults.

See "cxResults Session and Event Filtering" in the *IBM Tealeaf cxResults Administration Manual*.

Next steps

Now that the visitor identifier has been configured for your system, you must configure the search templates for visitors, so that individual visitor data can be found. See “Configure Search Templates and Session Lists.”

Other cxResults Settings

As part of your initial configuration, you should review the settings defined for IBM Tealeaf cxResults.

1. Login to the Tealeaf Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **Portal Management**.
3. In the left navigation bar, click the IBM Tealeaf cxResults Settings link.
4. You should review the specific settings listed below for the following categories.
   - For more information on Search settings, see "Visitor Extract."
   - For more information on Users settings, see "Visitor Server."

Visitor Extract

During initial configuration, please review the following configuration items:

Setting Description

`Populate Event TextFound column in Visitor Extract`

> **Note:** If this value is set to `Disabled`, event values are not available for search in the Visitor database. Unless there are storage space constraints, Tealeaf recommends verifying that this setting is `Enabled`.

`Reporting Visitor Data - Days to Retain`

> The number of days of data to retain in the Visitor database is set to `30` by default.
>
> **Note:** This setting directly impacts the size of your Visitors database.

- See "cxResults Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Visitor Server

No settings require review at this time.

- For more information on these settings, see "cxResults Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Visitor Dashboards

Tealeaf provides a set of dashboards for use with visitor data. These visitor dashboards can provide meaningful insight into aggregated visitor behavior.

Steps:

To access these reports:

1. In the Tealeaf Portal, select **Analyze** > **Segments** > **Analyze Visitor Segments**.
2. Select a segment to analyze.
3. Click the Report Gallery link at the bottom of the left navigation pane.
   - See "Analyzing Visitor Segments" in the *IBM Tealeaf cxResults User Manual*.
   - At this time, no additional configuration should be required to see visitor dashboards. For more information on configuration, see "Configuring Visitor Dashboards" in the *IBM Tealeaf cxResults User Manual*.

References

For more information on IBM Tealeaf cxResults, see "cxResults User Manual" in the *IBM Tealeaf cxResults User Manual*.

Testing Your Configuration

After you have completed your initial configuration, you can perform the following steps to verify the configuration.

For IBM Tealeaf cxResults, the key configuration to monitor is the creation, capture, and tracking of a unique visitor identifier across sessions. The steps below describe how to monitor visitor identifiers and the other configuration elements of IBM Tealeaf cxResults.

- A more complete set of tests can be executed after all Tealeaf components have been configured. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

1. **Database:** You should have already verified that the IBM Tealeaf cxResults Visitor database is installed and available. See “Verify Availability” on page 186.
2. **IBM Tealeaf cxResults User Accounts:** Login as a IBM Tealeaf cxResults user and verify that the account has access to all required menu items. See “cxResults User Administration” on page 187.
3. **Test Search:** If you have not done so already, you should verify that the user account can search for visitor identifiers using the default IBM Tealeaf cxResults search template. See "Searching for Visitors" in the *IBM Tealeaf cxResults User Manual*.
4. **Review unique visitor identifiers:** When you analyze visitor segments, the generated list indicates individual visitors who have access your web application. You should review values greater than 1 in the Matches column to check to see that the visitor identifier is used to reference the same visitor. See "Analyzing Visitor Segments" in the *IBM Tealeaf cxResults User Manual*.
5. **Visitor Dashboards:** Visitor dashboards should contain data. See "Analyzing Visitor Segments" in the *IBM Tealeaf cxResults User Manual*.

When all Tealeaf components are configured, you should complete an end-to-end test. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

Initial RTV Configuration

Note: This information provides a framework for completing the initial configuration of one component of the IBM Tealeaf CX system in a simplified deployment model. Depending on your Tealeaf solution's deployment, additional configuration can be required.

The IBM Tealeaf CX RealiTea Viewer allows Tealeaf users to search for and replay Tealeaf sessions on their local desktop systems. The standalone RTV application connects through the available network to the IBM Tealeaf CX platform to search for active or completed sessions and then displays them as they were originally experienced in a customized web browser.

This page describes how to complete the initial configuration of RTV.

- For more information about RTV, see "RealiTea Viewer (RTV) User Manual" in the *IBM Tealeaf RealiTea Viewer User Manual*.

RTV Installation

The IBM Tealeaf CX RealiTea Viewer is a standalone Windows application that must be installed on the desktop system of each Tealeaf user. Before you configure RTV, you must verify that the software is installed on your system.

Note: For Tealeaf Event Manager users, the installed major and minor version number of the IBM Tealeaf CX RealiTea Viewer on your desktop must match those numbers of IBM Tealeaf cxImpact.

1. From the Windows Start menu, select **Settings...** > **Control Panel**.
2. Double-click **Add or Remove Programs**.
3. In the list, if you see an entry for `Tealeaf RealiTea Viewer`, the application is installed.

- For more information about RTV minimum system requirements, see "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*.
- For more information about RTV installation, see "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Connect to Tealeaf

If you have not done so already, you must connect your installed version of RTV to the IBM Tealeaf cxImpact server. See "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Configuration

Before you begin configuring and using RTV, you must determine the roles of individual Tealeaf users. RTV roles can be broken into the following categories.

Role **Description**

RTV Administrator

Responsible for managing replay rules and global profiles. Can overlap with the Tealeaf application administrator. For more information about configuration tasks for RTV administrators, see "Configuring RTV for Administrators."

- RTV administrators can be required to configure replay rules to achieve high-fidelity replay of the monitored web application in RTV. See "RealiTea Viewer - Replay Rules" in the *IBM Tealeaf RealiTea Viewer User Manual*.

RTV User

Individual Tealeaf user who must use the RTV application to search for session data, replay selected sessions, and act on their findings. For more information about configuration tasks for RTV users, see "Configuring RTV for RTV Users" on page 194.

RTV User Who Edits Events

Tealeaf user or administrator who is responsible for creating and maintaining the event definitions that are used in the Tealeaf system. For more information about configuration tasks for these users, see "Configuring RTV for Users Who Edit Events" on page 195.

Configuring RTV for Administrators

This information describes the configuration steps that RTV administrators must complete before they enable Tealeaf users to access session data.

Configuring RTV user accounts: Any Tealeaf user with basic Portal access can also use the IBM Tealeaf CX RealiTea Viewer application.

Accounts assigned to RTV users cannot have their Default Replay Mode set to `BBR` at either the group or individual user level. It must be set to either `RTV` or `Prompt on Replay`. For more information:

- "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*
- "cxReveal User Administration" in the *IBM Tealeaf cxReveal Administration Manual*

Create or acquire default user profile:
After IBM Tealeaf cxImpact is initially installed, a default profile must be created and stored on the server.

- For more information about creating replay rules, see “Configuring the User Profile” on page 196.

You can search for sessions and complete a basic replay of them by acquiring the profile.

Note: The quality of session replay is dependent upon the nature of the web application. Websites that employ sophisticated display technologies or rely on client user interaction events can require significant customization of the common replay profile and replay rules. Those steps are covered in later sections.

To acquire the default RTV user profile, complete the following steps.

1. Run RTV.
2. In the RTV menu, select **Tools** > **Options...**.
3. Click the **Profiles** tab.
   - At the top of the panel, you must see the following message:
     `You are using the default built-in profile.`
4. Under the Default Profile, enter the server from which to acquire the default profile. Click **Check for Updates Now**.

Test RTV Connection: This information describes the steps that RTV administrators must take to test whether the RTV connection is working.

Testing search:
You can now test to see whether search is working.

1. In the RTV toolbar, click the **Search** button.
2. Specify a search that must return a non-zero number of sessions.
3. To run the search, click **Search...**.
4. In the Search Progress dialog, you must see search results displayed.

Testing replay:

Note: Replay is a complicated process and can require tuning of your RTV settings and possibly changes to the web application to get it to work properly. Now, you can test the basic capability of replaying sessions. You can see problems that must be addressed before production deployment.

1. After you have run the search, you must see a number of sessions that are listed in the Search Results tab.
2. Select a session that contains a high number of pages, as indicated in the Page Count column.
3. In the RTV toolbar, click the **Replay** button.
4. In the Replay tab, you must see a non-zero number of pages in the Viewable Pages list. In the pane to the right, the first page in the Viewable Pages list is displayed.
5. To test the replay of this session, click the**Replay** button in the toolbar.

6. If your installation of RTV is working properly, the session begins to replay as the user initially experienced it.

Save session:
If your session is a representative example of a typical user experience with your web application, you can choose to save it locally to help your subsequent configuration tasks.

1. When the session is open in RTV, from the menu select **File** > **Save...**.
2. Save it to a directory on your local workstation that is outside of the RTV installation directory.

Other Options tabs:
This information describes the other profile options that are available for RTV administrators.

Testing profile changes: Before you save your profile to the server, you can save a local copy and to test your local copy against sessions that are saved in `.TLS` files.

Copying host profile for other hosts:
If you have multiple hosts of your web application, you can rapidly create host profiles by copying the host profile that you create and modifying the destination profile as needed.

To copy the profile:

1. In the RTV menu, select **Tools** > **Options...**.
2. Click the **Profiles** tab.
3. Click **Edit Raw Profile...**. The raw XML of the profile is displayed.
4. Click in the profile text. Press `CTRL + A` to select all of it.
5. Paste the text into a text editor.
6. To retain a backup, save the text file.
7. Search the text file for the following string:
   ```
   <HostProfile
   ```
8. Verify that the value of the `name` attribute corresponds to the host that you configured.
9. Select the text that starts at the preceding string down till:
   ```
   </HostProfile>
   ```
10. Copy the text and paste the copy just after the preceding string.
11. Modify the `name` attribute in the first line of the copied text to match the host name for which you are applying the copied host profile.
12. Save the text file under a new name.
13. Press `CTRL + A` to select the entire profile.
14. Paste the text back into RTV.
15. Click **Save Changes & Exit**.
16. Click **Edit Profile...**.
17. The new host profile node must be displayed.
18. Modify the profile rules for the new host as needed.

Saving your profile to the server:
After you are satisfied with your user profile and rules for all hosts, you can post it to the common server for other Tealeaf users.

1. In RTV, select **Tools** > **Options...**.

2. Click the **Profiles** tab.
3. If you have not done so already, save a copy of your profile locally. Copy the contents of the raw profile into a text editor and save it to a local directory.
4. In the **Default Profile** text box, verify that the Server and port number correspond to the server that hosts the Portal application.
5. To see whether the server profile is updated since you last synced, click **Check for Updates**.
   - If other Tealeaf users can edit the server profile, you must select the Check for Updates at Startup.
6. If there are updates to the server profile, you must reconcile them with your saved local copy.
7. To upload the user profile that is currently stored in RTV, click **Upload Settings to Server**.
   - To apply specific settings to the BBR profile, click **Sync to BBR...**. Select the settings to apply to the BBR profile, and click **Commit...**.
8. In theOptions window, click **OK**.

Distribute connection information to RTV users: After you upload your setting changes to the server profile, you can distribute connection information to Tealeaf users.

Configuring RTV for RTV Users

This information describes the steps that RTV users must take to acquire their user profile.

Auto-configuring RTV from the Tealeaf master server:
After the RTV administrator configures the user profile, RTV users can enter the connection information to the master Replay Server and acquire the user profile.

1. Start RTV.
2. In the RTV menu, select **Tools** > **AutoConfig from TeaLeaf Master...**.
3. In the list of available IBM Tealeaf cxImpact systems, select the top node of the master server with which you want to sync.
   - Below each master server node, you can review the different servers and port numbers relevant to RTV that are part of the IBM Tealeaf cxImpact deployment.
   - If the master server is not listed, enter the simple host name in the IBM Tealeaf cxImpact Server textbox and click **Add**. If RTV is able to connect to the server, it is added to the list.
4. To sync with a listed server, click the server name in the server tree.
   a. To use the shared profile that is stored on the server, click the **Used Shared Profile** check box.

      Note: If no shared profile is available on the server, your local profile is unchanged.

   b. To configure your local installation of RTV to work with the selected IBM Tealeaf cxImpact server, click **Configure RealiTeaViewer to use this system**.

      Note: It is recommended that you configure RTV to auto-configure by using servers of the same version as the RTV installation. For example, if you are using Release 7.2 RTV, you must connect only to Release 7.2 IBM Tealeaf cxImpact servers.

- To remove a server from your list of available servers, select the server node in the list and click **Remove**.

5. After you complete the auto-configuration, click **Exit**.
   - See "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Updating your local profile:
If your RTV administrator is periodically updating the common profile, you must configure RTV to check for updates at startup.

1. In the RTV menu, select **Tools** > **Options...**.
2. Click the **Profiles** tab.
3. Under the Default Profile, enter the server from which to acquire the default profile.
4. Select the **Check for Updates at Startup** check box.
5. Click **Check for Updates Now**.
6. To save changes, click **OK**.
   - To restore your user profile to the default one provided by Tealeaf, click **Restore Default Profile**.

Configuring RTV for Users Who Edit Events

The Tealeaf Event Manager enables users with the appropriate permissions to create, edit, and delete Tealeaf events and related data. This information describes the configuration steps in RTV for users who must access TEM.

- See "Tealeaf Event Manager" in the *IBM Tealeaf Event Manager Manual*.

1. If you have not done so already, you must complete the configuration steps for RTV users. See “Configuring RTV for RTV Users” on page 194.
2. In the RTV menu, select **Tools** > **Options...**.
3. Click the IBM Tealeaf cxImpact tab.
   a. If Portal authentication is enabled, RTV must be provided with the Portal user name and password with which to connect to the Portal Server. Enter the user name and password to use to connect to the server.
      - See "RealiTea Viewer - Advanced Options Tabs" in the *IBM Tealeaf RealiTea Viewer User Manual*.
4. To save your configuration changes, click **OK**.
5. Users of the Event Manager must be part of the `Event Admin` group in IBM Tealeaf cxImpact.
   - See "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.
   - See "Event Administration" in the *IBM Tealeaf Event Manager Manual*.
6. To test the connection, in the RTV menu, select **Edit** > **Event Editor...**.
7. The Events tab of the Tealeaf Event Manager opens, displaying all event definitions on the server.
   - See "Tealeaf Event Manager" in the *IBM Tealeaf Event Manager Manual*.

Acquiring the Mobile License

If you have licensed the IBM Tealeaf CX Mobile module, RTV must be supplied with the license key to enable mobile-specific replay features. This configuration is also completed through the IBM Tealeaf cxImpact Options tab.

- See "RealiTea Viewer - Advanced Options Tabs" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Configuring the User Profile

After basic connectivity is established, RTV administrators can configure the user profile to contain hints on how to display content during replay. Using replay rules, you can provide instructions to RTV for how to handle specific pages or other aspects of the web application during replay.

This information describes how to configure the RTV user profile. The user profile is stored as an XML file inside your local RTV installation directory.

Note: It is recommended that you begin by modifying the user profile through the RTV GUI, instead of editing the raw XML.

The local RTV profile can be optionally synchronized with a common user profile stored on the server.

- This common user profile can be optionally synchronized with the user profile used by Browser-Based Replay. See "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Editing the RTV profile:

1. In the RTV menu, select **Tools** > **Options...**.
2. Click the **Profiles** tab.
3. Click **Edit Profile...**.
4. The nodes of the RTV profile are displayed. Specific nodes to modify are described in the following sections.
   - For more information about user profiles, see "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Backing up RTV profile: See "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Host-port remapping:
If needed, you can remap the hosts and ports that are detected in the transaction stream to another host:port number gateway. If it is not practical or desirable for replay to make requests to the live production server, you can change all references to the live server in replay data to point to the other server or to a null server.

Note: In a user profile, you can have no more than one host-port remapping.

1. In the Edit Profile dialog, double-click the Remap Host node.
2. Click **Add Hostname**. Enter your web application's host name in the following form:

   ```
   www.<host_name>.<ext>
   ```
3. Click **OK**.
4. To enable remapping, select one of the following remap options:
   - `Remap host to` - Enter the host to which you want to remap the source host name, using the same format.
   - `Remap host to NULL server` - If you do not have a remap server to use and do not want requests that are made to the source web server, this option effectively cancels any requests that are embedded in the replay data.

     Note: If this option is enabled, some content does not display properly during replay.

5. If you want, you can remap port numbers from the source web application's traffic to new port numbers on the remap server. Click **Add Port**. Enter the From and To remap ports, and click **OK**.
   - You can enter multiple port numbers to remap.
6. From the Protocol drop-down, you can select the protocol to use when you connect to the remap server. The `Auto` automatically detects the appropriate protocol to use.
7. To save your remap settings, click **OK**.

Ignore URLs:
Some URLs for your web application are not viewable pages, which can result in display issues in RTV. To avoid these pages, you can configure RTV to ignore URL patterns, including query parameters.

1. In the Edit Profile dialog, double-click the IgnoreURL node.
2. Enter the path information for the URLs to ignore. The path `/app/.asp?` instructs RTV to ignore any `.asp` file containing query parameters in the `app` tree of the source host.
   - The wildcards `*` and `?` are accepted.
   - When you specify URLs to ignore, start simple and specific. You can download a session and save it locally as a `.TLS` file and then to iterate on your ignore URL rules.
3. To save the IgnoreURL rule into your profile, click **OK**.
4. To create the IgnoreURL rule, in the Edit Profile dialog click **New...**. From the drop-down, select **Add IgnoreUrl...**.
   - For more information about configuring your profile, see "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Popup URLs:
If needed, you can configure RTV to recognize URLs that must be displayed in a popup window. When you browse to URLs that match the PopupURL pattern in the NavList, RTV displays them in a popup window.

- In Browser-Based Replay, popup URLs are displayed in the NavList yet are displayed as regular pages during replay.

1. In the Edit Profile dialog, double-click the PopupURL node.
2. Enter the path information for the URLs to treat as popups. Path configuration for popup URLs follows the same requirements as specifying Ignore URLs. See “Ignore URLs.”
3. To save the PopupURL rule into your profile, click **OK**.
   - For more information about configuring your profile, see "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Response modifications:
You can modify the response of replay data by performing pattern-based replacement of text. For example, response modifications can be used to prevent the unwanted execution of JavaScripts referenced or included in the response.

1. In the Edit Profile dialog, double-click the **ResponseMod** node.
2. For the specified host name, you can select whether the response modification is to be applied to all responses or to those matching a regular expression pattern.
   - Regular expressions are a powerful mechanism for specifying pattern matching. See "Regular Expressions in the RealiTea Viewer" in the *IBM Tealeaf RealiTea Viewer User Manual*.

3. In the **Pattern** text box, you can specify by using a regular expression the text for which to search the response.
4. In the **Replacement** text box, specify the text to replace the matched pattern.
5. Select whether to replace only the first occurrence (`First`) in the response or all occurrences (`All`).
6. To save your response modification rule, click **OK**.
7. After you specify your response modification rule, you must test it against sample data. See “Testing response modifications.”

Testing response modifications:
After you specify your response modification rule, you must test it against sample data.

1. Load a session that you can use to test the rule.
2. Click the**Response View** button in the toolbar.
3. Select some example text in the response to use for testing.
4. Right-click the selected text and select `Test Response Modify Rules...`.
5. TheTest Modify Rules window opens.
6. To test the selected text against the Response Modify rules for the page, click **Test**.
7. To edit the Response Modify rules, click **Edit Rules...**.
   - For more information about configuring your profile, see "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Configuring dynamic response modifications: If your web application includes data that is delivered from a third party, that content must be associated with a specific request. You can use dynamic response modification rules to modify response patterns that are based on the detection of Tealeaf events in the transaction stream.

- See "RealiTea Viewer - Creating Events" in the *IBM Tealeaf RealiTea Viewer User Manual*.

External file modifications:
If your web application references external files such as JavaScripts, you can configure a set of file modifications so that undesirable actions are not taken within the RTV web browser during replay. Typically, this feature is used to disable script execution.

1. In the Edit Profile dialog, double-click the **ExternalFileMod** node.
2. For the specified host name, enter the regular expression pattern for the file names to modify.
   - Regular expressions are a powerful mechanism for specifying pattern matching. See "Regular Expressions in the RealiTea Viewer" in the *IBM Tealeaf RealiTea Viewer User Manual*.
3. In the **Pattern** text box, you can specify using a regular expression the text for which to search.
4. In the **Replacement** text box, specify the text to replace the matched pattern.
5. Select whether to replace only the first occurrence (`First`) or all occurrences (`All`).
6. After you specify your external file modification rule, you must test it against sample data. See “Testing response modifications.”
7. To save your external file modification rule, click **OK**.

- For more information about configuring your profile, see "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Configuring dynamic external file modifications: You can use dynamic external file modification rules to modify external file data based on the detection of Tealeaf events in the transaction stream.

- You can configure these modifications by using the same interface as the one used to configure dynamic response modifications. See "RealiTea Viewer - Creating Events" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Creating frame rules:
If your web application uses framesets to organize the display page, you can create frame rules to deliver URLs to named frames in the frameset.

1. In the Edit Profile dialog, double-click the FrameRule node.
2. Enter the name of the frame to which to map the URL pattern.
3. In the Matching URL textbox, enter the URL pattern for the source page or pages to map into the frame.
   - The wildcards * and ? are accepted.
4. To apply the frame rule to your user profile, click **OK**.
   - For more information about configuring your profile, see "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Note: For dynamically loaded frames, you can create rules from the Viewable Pages list to manage frame placement. Right-click the page in the Viewable Pages list and select **Replay Rules...** > **Place this page in a frame...** and select the frame. The rule is then created to always place the page into the selected frame. See "RealiTea Viewer - Viewable Pages List" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Configuring replay for client-side user interface actions

The emergence of rich internet application technologies has greatly increased the utilization of client-side user interface events in web applications. These UI events may not be transmitted to the host server by default, which prevents Tealeaf from tracking them.

As an optional part of the IBM Tealeaf CX platform, the Tealeaf IBM Tealeaf CX UI Capture for AJAX can be deployed in your web application to provide detailed monitoring of client-side user interface events. The IBM Tealeaf CX UI Capture for AJAX can require additional development, configuration, and integration with your web application.

Note: IBM Tealeaf CX UI Capture for AJAX is only available to legacy users.

- For more information about UI Capture, see "UI Capture for Ajax Guide" in the *IBM Tealeaf UI Capture for Ajax Guide*.

If you are unable to deploy UI Capture at this time, you can configure RTV to complete some limited monitoring of client-side UI events.

- See "Monitoring Client UI Events through RTV" in the *IBM Tealeaf RealiTea Viewer User Manual*.
- If your web application uses Ajax technologies, additional configuration can be required. See "RealiTea Viewer - Ajax Replay" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Testing Your Configuration

After you complete your initial configuration, you can complete the following steps to verify the configuration.

For RTV, you must test the configuration for basic users, RTV administrators, and users of the Tealeaf Event Manager. The following steps are listed.

- A complete set of tests can be run after all Tealeaf components is configured. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

1. RTV Administrators: RTV administrators must test that they can change replay rules and that basic replay functionality is working.
   - If you have not done so already, you must verify that you can make a replay rule change and save it to the server. You might create an IgnoreURL rule for a URL that will never be displayed in the web application. After you complete this test, you should remove the rule.
   - Test basic replay now. See "RealiTea Viewer - Replay View" in the *IBM Tealeaf RealiTea Viewer User Manual*.

     Note: Replay is a complex process that can require regular review of replay rules to make it work properly. Now, you want to test basic replay functionality.
2. RTV Users: RTV users must be able to search for sessions and replay them. If you have not done so already, you must test a basic RTV user account to verify that search and replay are working properly.
   - See “Testing search” on page 192.
   - See “Testing replay” on page 192.
3. Tealeaf Event Manager Users: These users must be able to access the application now. From the RTV menu, select **Edit** > **Event Editor...**.
   - If RTV is properly configured, the currently available events are displayed.
   - Perform a simple change to an event definition, such as changing the description, and then commit the change back to the server to verify that your user account can modify event definitions.

When all Tealeaf components are configured, you must complete an end-to-end test. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

References

For more information about IBM Tealeaf cxVerify, see "cxVerify Administration Manual" in the *IBM Tealeaf cxVerify Administration Manual*.

- For more information about configuring tasks, see "cxVerify Configuring Tasks" in the *IBM Tealeaf cxVerify Administration Manual*.
- For more information about scheduling tasks, see "cxVerify Scheduling Tasks" in the *IBM Tealeaf cxVerify Administration Manual*.

Initial CX Mobile configuration

Note: This section provides a framework for performing the initial configuration of one component of the IBM Tealeaf CX system in a simplified deployment model. Depending on your Tealeaf solution's deployment, more configuration might be required. If you have any questions about configuration, contact http://support.tealeaf.com.

The IBM Tealeaf CX Mobile module extends the user agent detection, analysis, and reporting capabilities of IBM Tealeaf cxImpact to track user agents for mobile devices. Through IBM Tealeaf CX Mobile, you can identify and track the experiences of your customers connecting to your web application by mobile devices.

Note: The IBM Tealeaf CX Mobile module is a separately licensed module of the IBM Tealeaf CX platform. please contact your IBM Tealeaf representative.

- For more information about enabling, see "Overview of CX Mobile" in the *IBM Tealeaf CX Mobile User Manual*.
- For more information about data acquired from mobile devices, see "Overview of CX Mobile" in the *IBM Tealeaf CX Mobile User Manual*.

This page describes how to perform the initial configuration of IBM Tealeaf CX Mobile for Mobile Web, which manages the capture of user interface events and system properties from mobile devices that interact with your web application through a self-identified mobile browser.

Note: IBM Tealeaf CX Mobile for Mobile App enables the capture of user interface events and application properties from mobile native applications. It requires a separate installation, deployment, and configuration. See “Initial configuration for CX Mobile for Mobile App” on page 202.

Pre-Requisites

Before you begin, install all IBM Tealeaf software on Windows or Linux servers. For more information, see the *IBM Tealeaf CX Installation Manual*.

In addition, you must first complete the initial configuration steps for IBM Tealeaf cxImpact. For more information, see the *IBM Tealeaf CX Configuration Manual*.

UI Capture for Replay

Note: For RTV users, the IBM Tealeaf CX Mobile license must be deployed to the application from one of the hosting Tealeaf servers to enable proper replay of Mobile Web sessions. See "Search and Replay for Mobile Web" in the *IBM Tealeaf CX Mobile User Manual*.

RTV

Note: To replay Mobile Web sessions in Release 8.1 or later, you must install or upgrade to IBM Tealeaf CX UI Capture for AJAX to build 2011.03.15.1 or later.

- See "UI Capture FAQ" in the *IBM Tealeaf UI Capture for Ajax FAQ*.
- See "UI Capture for Ajax Guide" in the *IBM Tealeaf UI Capture for Ajax Guide*.
- Replay of sessions that are captured from native applications has a different set of requirements. See "Search and Replay for Mobile App" in the *IBM Tealeaf CX Mobile User Manual*.

Configuring Tealeaf CX Mobile

IBM Tealeaf CX Mobile for Mobile Web relies on the WURFL standard for detecting mobile user agents. This `.csv` file must be downloaded, converted into a usable form for Tealeaf, and then made available to the IBM Tealeaf CX platform. This standard must be updated regularly. See "Configuring Tealeaf for Mobile Visitors" in the *IBM Tealeaf CX Mobile Administration Manual*.

Configure events for CX Mobile

The Mobile Traffic Dashboard that is imported in the previous step includes events to detect mobile visitors and other meaningful information that is related to their experience. These events test for the presence of specific name-value pairs in the `[ExtendedUserAgent]` section of the request.

The `[ExtendedUserAgent]` section is added to the request by enabling extended user agent parsing.

- For more information about enabling this feature, see "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

For more information about the events for mobile visitors that become available through extended user agent parsing, see "Events for Mobile Visitors" in the *IBM Tealeaf CX Mobile User Manual*.

Testing your configuration

For IBM Tealeaf CX Mobile, you must verify that the Mobile Dashboard was properly imported and that mobile events are appearing in reports. Testing the CX Mobile is part of end-to-end testing of your Tealeaf components.

You might need to wait a few minutes after you enable user agent detection and import the mobile dashboard before mobile events are being triggered by session data. If you experience difficulties while you are searching for events or viewing the Mobile Dashboard, wait a few minutes and try again.

When all Tealeaf components are configured, complete an end-to-end test. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

1. Search for events. Through the Portal or RTV, run a search for any of the mobile events that are imported with the dashboard.
2. Review the Mobile Dashboard. If you installed the Mobile Traffic dashboard:
   a. In the **Dashboard** menu, select the **Mobile dashboard**.
   b. Review the content in the dashboard to verify that it is being populated with data.
3. Review other Tealeaf reports. Check the other mobile visitor reports in Tealeaf to verify that they are being populated with data.

Initial configuration for CX Mobile for Mobile App

To capture data from mobile native applications, you must deploy one or more of the following Logging Frameworks with your application. When deployed and configured, the following Logging Frameworks capture user interface events and application properties from native applications that are developed for the listed mobile operating systems.

Note: Use of the Tealeaf Logging Frameworks for mobile native applications requires the Tealeaf CX Mobile license for Mobile App. For more information, contact your Tealeaf representative.

Note: Licensees must use code that is provided by Tealeaf in their apps. For more information on downloading Tealeaf software, see Tealeaf CX Downloads.

Logging Framework
Description

Android Logging Framework
Logging Framework for Android-based applications. See "Tealeaf Android Logging Framework Reference Guide" in the *IBM Tealeaf Android Logging Framework Reference Guide*.

iOS Logging Framework
Logging Framework for iOS-based applications. See "Tealeaf iOS Logging Framework Reference Guide" in the *IBM Tealeaf iOS Logging Framework Reference Guide*.

References

- For more information about IBM Tealeaf CX Mobile in general, see "TLTopic - Mobile" in the *IBM Tealeaf Topics*.
- For more information about using IBM Tealeaf CX Mobile, see "Tealeaf CX Mobile User Manual" in the *IBM Tealeaf CX Mobile User Manual*.
- For more information about configuring IBM Tealeaf CX Mobile, see "Tealeaf CX Mobile Administration Manual" in the *IBM Tealeaf CX Mobile Administration Manual*.
- For more information about IBM Tealeaf CX UI Capture for AJAX, see "UI Capture FAQ" in the *IBM Tealeaf UI Capture for Ajax FAQ*.

Testing Your Tealeaf Solution

After you complete installation and the initial configuration tasks for each licensed Tealeaf product and module, verify the operations of your Tealeaf solution. This section provides a simple procedure for testing end-to-end operations of the Tealeaf solution, with modifications based on optional components that you may have installed.

Methodology

This testing procedure requires the generation of a test session on the web application and the capture of the session through Tealeaf and locally through the Tealeaf Client-Side Capture utility.

As you browse through the session, you can test, search, replay, and report capabilities for active sessions and then perform similar tests when the session completes.

- In an active session, hits are currently being added to the session stored in the in-memory Short Term Canister, or the session is not yet closed or timed out.
- A completed session is a closed session that moved from the Short Term Canister to the Long Term Canister for indexing and storage. Sessions that archived out of the LTC are also considered to be completed sessions.

The methodology tests the following fundamental features of the Tealeaf solution by locating your captured session data in various parts of the capture, processing, and reporting areas of the Tealeaf solution.

Features

- Capture: Session capture by the IBM Tealeaf CX Passive Capture Application.
- Search: Search for the session data as an active or completed session.
- Replay: Replay of the session through Browser-Based Replay and the IBM Tealeaf CX RealiTea Viewer as an active and completed session
- Reporting: Display of data in the Portal as an active or completed session

- Data Export: Export of captured and processed data

Temporary Configuration Changes

The previous steps mirror the generalized flow of data through the solution, which is outlined below.

- All items below apply to completed sessions. Items also marked (`active`) apply to active sessions, too.

General Data Flow of Session Data throughIBM TealeafCX

- Active session begins.
  - (`active`) Session is available for replay in Portal and RTV.
- Session is completed.
- Session is moved from Short Term Canister to Long Term Canister.
- Session is indexed for search in LTC.
  - (`completed`) Session becomes available for search by using completed search templates in the Portal and RTV.
- Session data is aggregated for reporting purposes.
  - (`completed`) Session data populates Portal reports.
- Session data is trimmed from the Long Term Canister and, optionally, archived.

For testing purposes, you may want to shorten the intervals for some of the steps to hasten the testing process. These intervals can be configured by modifying the following configuration options.

Note: Do not make these changes on a production server. These changes should only be applied in a testing environment and should be reverted when the testing is complete.

- Session is indexed for search in LTC: For more information about configuring indexing, see "Configuring CX Indexing" in the *IBM Tealeaf CX Configuration Manual*.
  1. The control program for indexing (`indexprogram`) checks for sessions that need indexing that is based on the `Sleep Time When No Work` setting.
  2. When sessions are detected that need indexing, the indexing process begins. Indexes are not committed to disk, which enables searching until the `Direct Pull Timeout` setting expires or the index size exceeds the `Maximum Index Size` threshold.
- Session data is aggregated for reporting purposes: By default, the Data Collector polls the Long Term Canister for data to aggregate every five minutes.
  1. If necessary, you can restart the Tealeaf Data Collector Service through the Windows Services Control Panel to immediately perform a data collection. However, you must be certain that the data to be collected is already generated for this step to work.

Installation

Before you begin, install the following components, if you did not do so already.

- Client-Side Capture: The Tealeaf Client-Side Capture is a plug-in for Fiddler that enables the capture of your IE navigation experience to your local desktop. The session that you explore on the monitored web application is captured locally as a control to test the results of capture, processing, and replay through Tealeaf's replay features.

  - For more information about installing Client-Side Capture, see "Using Client-Side Capture for Fiddler" in the *IBM Tealeaf Client-Side Capture Manual*.
- **IBM Tealeaf CX RealiTea Viewer:** The RTV application can be installed on the desktop systems of Tealeaf users to enable the search and replay of session data. Additionally, through RTV, users with the appropriate permissions can edit event definitions that are applied to the Tealeaf capture stream.
  - If RTV is used by Tealeaf users in your enterprise, you should test its capabilities as part of the testing process. For more information about installing RTV, see "RealiTea Viewer Overview" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Some Considerations in Generating Your Test Session

Before you capture your test session, you should consider the following items, which may affect the pages that you attempt to capture:

- Session Identifier: You should decide how you are going to explore the web application in a way that permits you to uniquely identify the session through search and replay. When you test the captured session, you must be able to uniquely identify it.
  - If no unique identifier is available, you may be able to identify the session by timestamps.
  - If you licensed and deployed IBM Tealeaf cxResults, you can use the visitor identifier that you configured for the product. See "Initial cxResults Configuration" in the *IBM Tealeaf cxResults Administration Manual*.
- Tracking Event: You should design your session so that you trigger at least one known event that you configured for the web application. Later, you can use this event as a key for digging through Tealeaf report data to locate the completed session.
- Scorecard: For testing report features, you should trigger an event that registers in a KPI or Process Scorecard.
  - For more information about KPI scorecards, see "Using Scorecards" in the *IBM Tealeaf cxView User Manual*.
  - For more information about Process scorecards, see "Using Scorecards" in the *IBM Tealeaf cxView User Manual*.
- PCA: Before capture, you may want to open the Summary tab of the PCA Web Console, where you may be able to monitor the traffic if there is little other activity on the web application.
  - If you have enabled data filter rules, configured traffic to ignore, or other tuning parameters, you may want to design your capture session so that you test these settings. For example, if you know of specific host traffic that is configured to be ignored, you should design your session to generate session data from that host, which is forwarded to the PCA and then ignored. See "PCA Web Console - Interface Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
  - If the PCA is capturing some SSL traffic, you should design your session to explore secured areas of the web application. See "PCA Web Console - Interface Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
  - The PCA supports data sessioning, multiple capture modes, inclusion and exclusion of specific file extensions, and other features. You should be able to design your capture to identify that the captured and processed data properly reflects capture mode, file extension settings, and any data sessioning configuration that is managed through the PCA. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

  - The following configuration areas may require separate captures in order to test them well.
  - Privacy rules that are applied at the PCA should be thoroughly tested. Depending on the complexity of your configured rules, you should consider reviewing each of them through a separately captured session. See "PCA Web Console - Rules Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
    - Privacy Tester rules can also be tested through the external Privacy Tester utility. See "Privacy Tester Utility" in the *IBM Tealeaf CX Configuration Manual*.
- TMS: No additional tests are required. See "Initial TMS Configuration" in the *IBM Tealeaf CX Configuration Manual*.
- **IBM Tealeaf cxImpact:** No additional tests are required. See "Initial Portal Configuration" in the *IBM Tealeaf CX Configuration Manual*.
- Pipeline: No additional tests are required. See "Initial Portal Configuration" in the *IBM Tealeaf CX Configuration Manual*.

Optional Components

- RTV: RTV tests are included as part of the workflow in this testing procedure.
- IBM Tealeaf cxResults: The key criteria for configuring IBM Tealeaf cxResults are establishing a unique, multi-session identifier for each visitor and being able to search for visitors. See “Testing for Unique cxResults Identifier” on page 210.
- IBM Tealeaf cxReveal: No additional tests are required. See "Initial cxReveal Configuration" in the *IBM Tealeaf cxReveal Administration Manual*.
- IBM Tealeaf CX Mobile Module: Optionally, you can perform these tests by using a mobile device to verify proper configuration of the IBM Tealeaf CX Mobile module. See “Testing for Mobile Visitors” on page 210.
- IBM Tealeaf cxConnect for Data Analysis: No additional tests are required. See "Initial cxConnect Configuration" in the *IBM Tealeaf CX Configuration Manual*.
- IBM Tealeaf cxVerify: No additional tests are required. See "Initial cxVerify Configuration" in the *IBM Tealeaf CX Configuration Manual*.

To capture all of the above configuration items, you may decide to perform multiple captures of different aspects of the web application. Since some of the following tests are applied while the session is still active, you should perform all of the tests on the page for the first session before you begin capture and testing of any subsequent sessions.

- See “Capturing Additional Test Sessions” on page 210.

Generate Session

1. Open Internet Explorer.
2. Browse to the home page of the web application.
3. Start Client-Side Capture.
4. Note the time at which you started local capture. This timestamp should be correlated to the timestamps that later appear in the Portal.
5. Navigate to the pages in the web application that you must capture to complete the tests of the above systems.
6. Do not close the session. Continue with the following tests.

   Note: Depending on the data volume, network throughput, and server performance, there may be a delay between beginning your session and hits appearing in Tealeaf.

Active Session Tests

The following tests can be applied to the active session you are currently capturing.

Capture

If you are in a production environment with general web traffic, you may not be able to test for the capture process only. It may not be easy to detect the hit data for your specific active session through the PCA Web Console or the Windows pipeline, which receives the PCA data.

However, if you are in a test environment with no other traffic, you may be able to verify capture by monitoring the following sections in the Summary Tab of the PCA Web Console:

- Current Per Seconds Stats section indicates the transfer rates of each PCA process through the pipeline.
- Peers section indicates delivery of PCA data to the destination Processing Server and its Windows pipeline.
- See "PCA Web Console - Summary Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

Reporting

Through the Portal, you can review all active sessions. From the **Portal** menu, select **Active** > **Sessions**. The session list displays all active sessions. If you are able to locate the session that you are currently creating, then you verified that the Windows pipeline is working properly.

- In the Portal session list, you can click the **Info** icon to review session information for verification purposes. See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.

In the Session List, click the **Pages List** icon to display a list of pages in the session. You can drill into individual pages to review captured data. This area is useful for reviewing Windows pipeline operations, such as privacy, Tealeaf reference values, and more.

- You can also replay the active session from this screen.
- See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.

Search

To search for active sessions through the Portal, select **Search** > **Active Sessions**. See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.

- If you triggered a known event in your session, you can search by that event for sessions.
- To search for active sessions in RTV, click the Search Active Sessions check box in the Search Builder tab. For more information about RTV search, see "RealiTea Viewer - Session Search and Subsearch" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Replay

If you find the active session in the Portal, you can click the **Camera** icon in the Session List to replay the session.

- Depending on your configuration, you may be able to use the method to replay in the Portal, RTV, or both. See "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual*.

- For more information about RTV replay, see "RealiTea Viewer - Replay View" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Completed Session Tests

If you successfully completed the tests, then you can end the session at which point it is queued for transferred to the Long Term Canister for indexing.

- Stop your Client-Side Capture, and save the capture file to a local directory.

Capture

No additional testing is required.

Search

If you are able to find your completed session by using a completed session template, then you verified indexing operations. Specifically, you should perform a search for known data in the `[appdata]` section of the request, which is always indexed.

- If you triggered a known event in your session, you can also search by that event for sessions.
- See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.
- For more information about RTV search, see "RealiTea Viewer - Session Search and Subsearch" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Searching for Visitors: If you enabled IBM Tealeaf cxResults, you can perform a search for the session that is based on the visitor identifier. When you drill down into the results, you should be able to retrieve the same session as above.

- For more information, "Searching for Visitors" in the *IBM Tealeaf cxResults User Manual*.

Replay

In the Session List page, you can click the **Camera** icon to replay the session. For replay in this case, verify the following against the version you captured by using Client-Side Capture:

- Verify the page counts of each capture.
- Verify that the last page of each capture corresponds to the other capture.

For RTV:

- Look at several pages in the RTV capture to verify that all meaningful content is displayed.
- If highlighting is enabled in RTV, check that the appropriate page elements have been properly highlighted.
- If UI Capture is deployed in your web application, then you should verify that a selection of UI events is captured and displayed appropriate in RTV.
  - UI Capture requires a separate deployment of JavaScript into your web application infrastructure. See "UI Capture for AJAX Guide" in the *IBM Tealeaf UI Capture for AJAX Guide*.

Discrepancies between the Tealeaf replay and your CSC replay should be reconciled by using replay rules in your profile.

- See "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Reporting

Event reporting:
If the events for your captured session tabulated for reporting purposes, complete the following steps.

1. In the **Portal** menu, select **Analyze** > **Report Builder**.
2. Click **Add Event**.
3. Select the event that you triggered in your captured session. Click **Select**.
4. Verify that the Focus Date is configured for today or the date when you created the session.
5. Click **Refresh** if necessary.
6. In the displayed chart, find the hour during which the session was made. If you cannot find the appropriate link, click the **Total** link at the bottom of the display.
7. The list of relevant sessions is displayed. Find your session in the displayed list.
8. If you are able to complete the test, then you verified that event data from your session is available for reporting.
   - See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

Aggregated data reporting:
Identify if the aggregated data from captured session is tabulated for reporting purposes, complete the following steps.

1. In the **Portal** menu, select **Analyze** > **Scorecards**. The Scorecards screen is displayed.
2. Verify that the Focus Date is configured for today or the date when you created the session.
3. For Focus Period, select `Day`.
4. Click **Change**. Select a scorecard that includes events that are triggered during your captured session. Click **Select**.
5. Click **Refresh** if necessary.
6. In the displayed scorecard, click a link that displays a count of sessions for the event that was triggered during your capture.
7. An event chart for the selected event is displayed.
8. In the displayed chart, find the hour during which the session was made. If you cannot find the appropriate link, click the **Total** link at the bottom of the display.
9. The list of relevant sessions is displayed. Find your session in the displayed list.
10. If you are able to complete the test, then you verified that your session data is being aggregated for reporting.
    - See "Using Scorecards" in the *IBM Tealeaf cxView User Manual*.

Data Export

You can test the data export features of the Tealeaf system by completing the following procedures.

Export Chart

1. From the **Portal** menu, select **Analyze** > **Report Builder**.
2. Select an event, reporting period, and server options so that you can see data display on-screen.

3. Use the buttons in the upper-right corner to test export to Microsoft Excel and PDF.
   - See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.
4. Verify the data in the exported chart against the displayed version.

Export Scorecard

1. From the **Portal** menu, select **Analyze** > **Scorecards**.
2. Select a scorecard and reporting period that contains data.
3. Use the buttons in the upper-right corner to test export to Microsoft Excel and PDF.
   - See "Using Scorecards" in the *IBM Tealeaf cxView User Manual*.
4. Verify the data in the exported scorecard against the displayed version.

Export Dashboard

1. From the **Portal** menu, select a dashboard from the **Dashboards** menu.
2. Verify that the dashboard contains meaningful data.
3. In the upper-right corner, click **Options**.
4. Email the dashboard to yourself.
5. A PDF version of the dashboard is attached to the email. Verify the data in the exported dashboard against the displayed version.

Capturing Additional Test Sessions

You may want to create sessions to test the following situations:

Testing for Mobile Visitors

If you enabled the IBM Tealeaf CX Mobile module, you can perform the tests by using a mobile device to verify that Tealeaf is properly configured to capture mobile user activities.

Testing for Unique cxResults Identifier

If you licensed and enabled IBM Tealeaf cxResults, generate and close a second session to verify that you generated a visitor identifier in the session list that matches two sessions. See "Analyzing Visitor Segments" in the *IBM Tealeaf cxResults User Manual*.

Alerts

If you enabled the alert service, complete the following procedure to test alerts.

- For more information about enabling the alert service, see "Configuring the Alert Service" in the *IBM Tealeaf CX Configuration Manual*.

This procedure defines an alert that is triggered when the number of active sessions is greater than 1. After you define the alert and commit your changes, when you begin exploring the web application, you should receive an alert email.

- Alerts are generated through the Event Manager in the Tealeaf Portal. See "Tealeaf Event Manager" in the *IBM Tealeaf Event Manager Manual*.
- For more information about configuring alerts, see "TEM Alerts Tab" in the *IBM Tealeaf Event Manager Manual*.

1. Log in to the Portal as an administrator.
2. In the **Portal** menu, select **Configure** > **Event Manager**.
3. In the Tealeaf Event Manager, click the **Alerts** tab.
4. Click **New Canister Alert**.

5. Click the Active check box.
6. For Alert Type, select `Count`.
7. Click **Select Event**. Select the **Active Sessions** event.
8. For Alert Function, select `Positive`.
9. Click the Alert Threshold Only check box.
10. In the **Threshold** text field, enter a value of `1`.
11. For Interval, enter a value of `100`.
12. For Reset, enter a value of `100`.

    Note: This alert should fire only one time. After you verified the test, modify the alert properties or delete the alert.
13. Clear the **Enable Warnings** check box.
14. In the Notification panel, select the email check box and clear all other check box.
15. Enter your email address in the space provided.
16. In the Blackout panel, verify that the Enable Alert Blackout check box is not selected.
17. Click **Save Draft**.
18. The Alert should be displayed in red in the Alerts tab.
19. To commit the changes to the server, click **Commit Changes**.
20. Open a browser window to explore the application that is monitored by Tealeaf.
21. Open a second browser to explore the application. You should now have two active sessions, which exceed the alert threshold.
22. A copy of the alert should be emailed to you.
23. Remember to delete the alert after you received and reviewed it.
    - See "TEM Alerts Tab" in the *IBM Tealeaf Event Manager Manual*.

Next Steps

If all of the tests complete successfully, your Tealeaf solution is operational.

Remember to switch any temporary configuration settings back to their previous values. See “Temporary Configuration Changes” on page 204.

Chapter 4. CX Pipeline Session Agents

Tealeaf **session agents** can be deployed in the data capture process to filter the data that is retained by the Tealeaf system. You can define session agents to discard uninteresting or repetitive data, expand compressed data, filter out private or sensitive data, and more.

This section describes how to enable configure session agents for the pipeline and to monitor the pipeline's health with a set of utilities.

- **"CX Pipeline Configuration" on page 214**
- **"Overview of the Capture Pipeline and Session Agents" on page 224**
  - "Adding a Session Agent" on page 226
  - "Archive Session Agent" on page 227
  - "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
  - "Canister Session Agent" on page 236
  - "Cookie Parser Session Agent" on page 238
  - "Data Drop Session Agent" on page 241
  - "Data Parser Session Agent" on page 246
  - "Decouple Session Agent" on page 250
  - "DOM Capture Virtual Hit Session Agent" on page 254
  - "Extended Decoupler Session Agent" on page 252
  - "Extended Privacy Session Agent" on page 261
  - "Health-Based Routing (HBR) Session Agent" on page 263
  - "Inflate Session Agent" on page 271
  - "JSON Mobile Parser Session Agent" on page 275
  - "Managed Code Session Agent" on page 287
  - "Null Session Agent" on page 290
  - "Privacy Session Agent" on page 291
  - "Real-Time Monitoring and Alert (RTA) Session Agent" on page 321
  - "Response Tags to Request Session Agent" on page 326
  - "RTA Split Session Agent" on page 328
  - "Sessioning Session Agent" on page 332
  - "Session Router Session Agent" on page 330
  - "Socket Session Agent" on page 335
  - "Statistics Logger Session Agent" on page 337
  - "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
  - "Tealeaf Reference Session Agent - Legacy Mode" on page 357
  - "Tealeaf Sessioning Session Agent" on page 360
  - "TimeGrades Session Agent" on page 366
  - "TLI Session Agent" on page 368
  - "URL Decode Session Agent" on page 382
- **"CX Pipeline Utilities" on page 384**
  - "TeaLeaf Archive Reader - Run Archived Sessions" on page 384
  - "Privacy Tester Utility" on page 390

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– “TeaLeaf Capture Status - Pipeline Monitoring Utility” on page 386
– "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*

CX Pipeline Configuration

The IBM Tealeaf CX Pipeline is composed of a series of modules that you enable and configure to perform a specific set of operations on captured data. Each module, called a **session agent**, performs a specific manipulation on the captured data and forwards it to the next session agent. At the end of a IBM Tealeaf CX pipeline, a terminal agent performs final pipeline disposition of the session data, which may include forwarding to a Short Term Canister (canister in the diagram below), to an archive, to another port on the server for processing by a different pipeline, or to the NULL session agent, which discards the data.

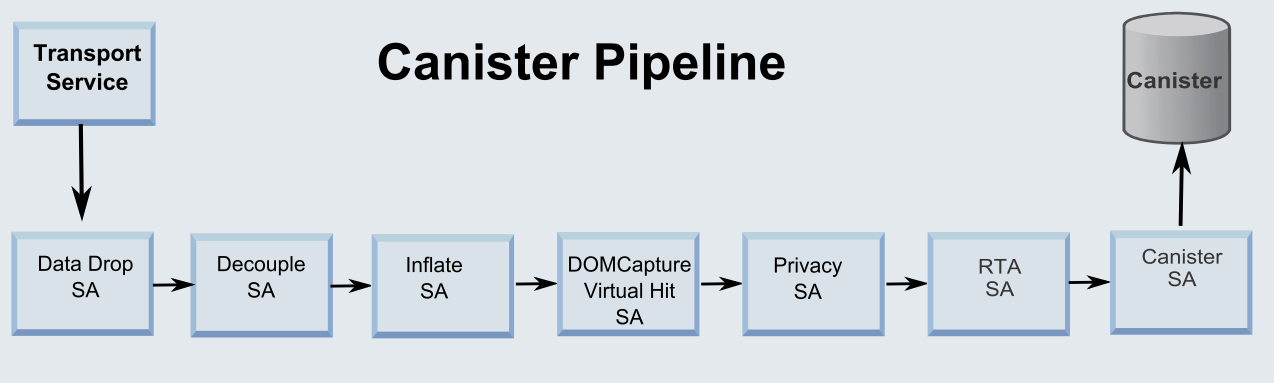

Figure 28. Example of IBM Tealeaf CX Pipeline

After traffic has been captured by the IBM Tealeaf CX Passive Capture Application, it is forwarded to the Processing Server, where captured data is passed into the pipeline. Data is passed from one session agent to the next one in the pipeline, with each agent performing one or more manipulations on the data. The output of session agent #1 is the input of session agent #2.

Note: The **DOM Capture Virtual Hit** session agent shown in Figure 28 is needed only if you are going to perform DOM capture. Additionally, if you decide to perform DOM capture, the **DOM Capture Virtual Hit** session agent must be configured after the Inflate session agent and before the Privacy session agent.

Tealeaf session agents in the pipeline can modify the data with no effects on the visitor.

In the diagram below, you can see how multiple instances of the IBM Tealeaf CX Passive Capture Application can feed the same pipeline. Since each instance of the IBM Tealeaf CX Passive Capture Application can be configured with individual delivery options, the downstream destination of each PCA instance can be the same pipeline on the same server. See "Passive Capture Configuration via Web Console" in the *IBM Tealeaf Passive Capture Application Manual*.

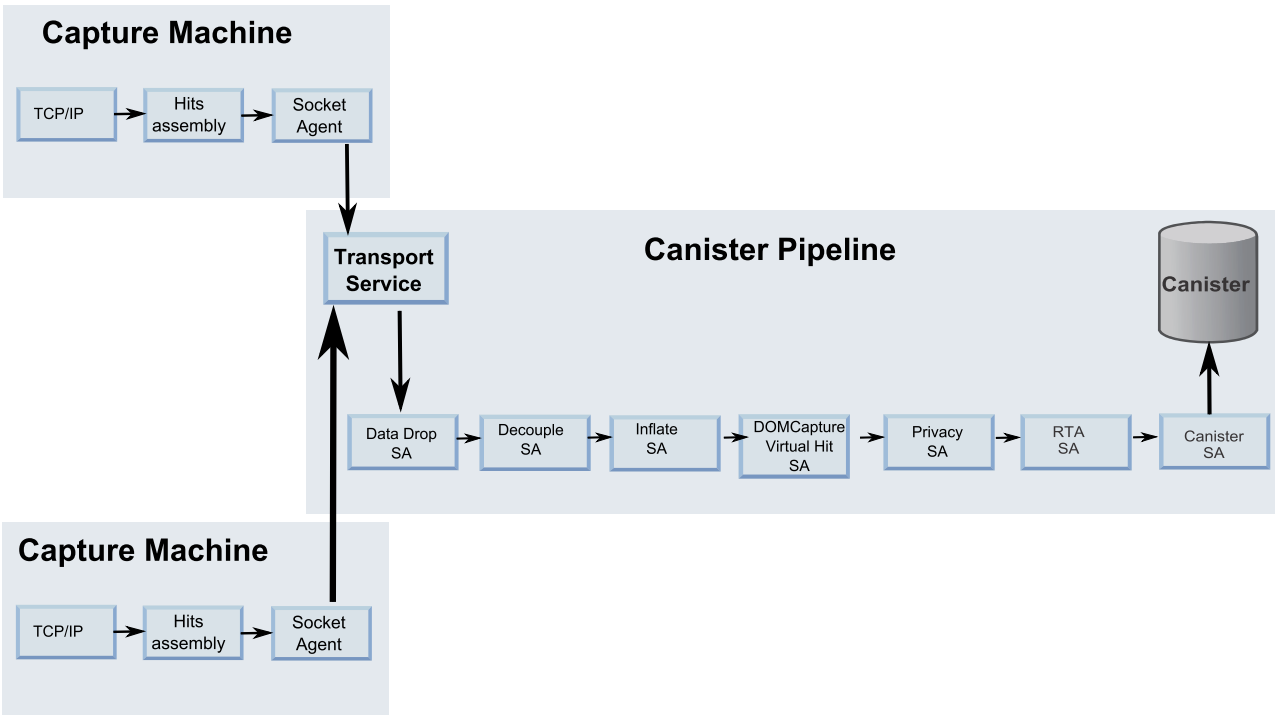

Figure 29. Multiple IBM Tealeaf CX Passive Capture Application Instances Feeding the Same Pipeline

This section covers the basics for configuring the IBM Tealeaf CX pipeline.

Capture Modes

Tealeaf Technology provides the following modes of capture:

- **Business Mode** Captures HTML data. Does not capture binary data such as GIF, JPEG, and PDF file formats.
- **BusinessIT Mode** Captures the same information as Business capture mode and in addition captures request files for all data, including the requests for binary data. BusinessIT mode does not capture the binary files themselves.

The above modes are configured in the IBM Tealeaf CX Passive Capture Application. See "Passive Capture Configuration via Web Console" in the *IBM Tealeaf Passive Capture Application Manual*.

Default Pipelines

Depending on the role of the server on which you are installing the pipeline, the following pipelines are the default configurations for the deployment. In the sections below, the required session agents are listed in the order of appearance in the pipeline.

Note: All of the listed session agents are required. You may add session agents to the pipeline.

Processing Server without HBR

For a Processing Server (Canister) without a Health-Based Routing (HBR) server in front of it, the following pipeline is the default pipeline.

Configuring the Transport Service

- “Data Drop Session Agent” on page 241
- “Extended Decoupler Session Agent” on page 252
- “Inflate Session Agent” on page 271
- “Privacy Session Agent” on page 291
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Canister Session Agent” on page 236

Processing Server with HBR

For a Processing Server with an HBR server in front of it, the following pipeline is the default pipeline. When HBR is enabled, the HBR Server contains most of the processing session agents. For more information about HBR, see “HBR Server” and “Health-Based Routing (HBR) Session Agent” on page 263. For more information about Privacy

Attention: In multi-pipeline environments, do not enable the extended privacy session agent (`PrivacyEx`) for child pipelines that have HBR enabled. If HBR and `PrivacyEx` are enabled for a child pipeline, the service can run out of memory and cause the service to restart unexpectedly. For more information about `PrivacyEx`, see “Extended Privacy Session Agent” on page 261.

Configuring the Transport Service

- “Data Drop Session Agent” on page 241
- “Extended Decoupler Session Agent” on page 252
- “Session Router Session Agent” on page 330
- “Canister Session Agent” on page 236

HBR Server

For the Health-Based Routing (HBR) Server in your environment, the following pipeline is the default configuration.

- For more information on HBR, see “Health-Based Routing (HBR) Session Agent” on page 263.

Configuring the Transport Service

- “Data Drop Session Agent” on page 241
- “Extended Decoupler Session Agent” on page 252
- “Inflate Session Agent” on page 271
- “Privacy Session Agent” on page 291
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Health-Based Routing (HBR) Session Agent” on page 263

How to Configure the Pipeline

In most environments, the Tealeaf installer automatically preconfigures the pipeline based upon the components selected for installation. For example, if the Processing component was selected, the installer adds the Canister session agent to the pipeline. So, in most cases, no additional configuration of the pipeline session agents is required.

You can set up individual pipelines for each port to which the IBM TealeafCX Passive Capture Application is forwarding captured data. Pipelines can also be arranged in parent-child relationships.If needed, you can configure main and child

pipelines through the Pipeline Editor, which is available through TMS. The Pipeline Editor is a graphical interface available to Tealeaf administrators through TMS in the Tealeaf Portal. You can drag and drop items to build your pipelines for processing captured Tealeaf data. For more information on TMS and the Pipeline Editor, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Note: Depending on the Tealeaf products that you have licensed, some session agent functionality may not be available.
Attention: In multi-pipeline environments, do not enable the extended privacy session agent (`PrivacyEx`) for child pipelines that have HBR enabled. If HBR and `PrivacyEx` are enabled for a child pipeline, the service can run out of memory and cause the service to restart unexpectedly. For more information about `PrivacyEx`, see "Extended Privacy Session Agent" on page 261.

Note: Pipeline configuration can also be performed by editing a configuration file. In future releases, this option may not be available, so it is recommended that you use the Pipeline Editor to configure pipelines. For more information on manual configuration, see "Manual Pipeline Configuration" on page 218.

Configuration with Capture Filter

Capture Filter configuration

As a proof-of-concept method, you can configure a capture filter to perform capture services through Microsoft IIS. This capture method enables rapid deployment of the Tealeaf system without having to implement a dedicated IBM Tealeaf CX Passive Capture Application server. However, there are performance implications in capturing through IIS.

Capture settings are controlled by the capture filter configuration file. Each supported platform has its own capture configuration file. This chapter discusses how to modify the capture configuration file to control the resulting captured data.

Capture Source or Service
Configuration File Name

Microsoft IIS
`TeaLeafIIS.cfg`

Tealeaf Client-Side Capture
Configured using the Tealeaf toolbar that you can install in Microsoft Internet Explorer. The Client-Side Capture software is provided with the Tealeaf distribution.

Tealeaf Transport Service
`TeaLeafCaptureSocket.cfg`

Tealeaf Cookie Scheme

Tealeaf Web capture filter uses three types of cookies to determine the content that belongs to a session, as well as where each session starts and stops. The cookie format consists of a 32-byte GUID (Globally Unique ID). The following three cookies are used:

- **TLTSID** (Session) is a temporary cookie, active only for the length of a browser session, used to group hits into a session. The end user can decide whether or not to allow this cookie.
- **TLTHID** (Hit) Assigned at the server, a hit cookie is used to identify a hit within a session. This temporary cookie is useful for server side processing of the hit.

For example, if the hit is processed by an application server or a server handling instrumentation with the event API, the TLTHID is used by this server to identify the hit. The end user has no control over whether or not to allow the TLTHID.

- **TLTUID** (User) is a persistent cookie with a long expiration used to determine the user that generated the session. The end user has control over whether or not to allow this cookie. This cookie is available only for applications running under Internet Information Services (IIS).
  The Tealeaf Web capture filter issues these cookies and should be installed on the Web server. The cookies are visible to the downstream application server.

Monitoring Socket Capture Status

Through TMS, you can monitor statistical information on the socket capture process for each pipeline in your environment. From the **Pipeline Status** tab, you can see the active connections, byte transfer rates, and page views as currently sampled in the pipeline data. You can also review how the data is passed through each session agent in the pipeline. See "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Manual Pipeline Configuration

Through a single configuration file, you can define one or more pipelines to manipulate captured data. In the Tealeaf install directory, the `TeaLeafCaptureSocket.cfg` file contains the configurations of each session agent available in your Tealeaf solution.

Building a Pipeline in the Configuration File

You can set up individual pipelines for each port to which the IBM Tealeaf CX Passive Capture Application is forwarding captured data.

1. In a text editor, open `TeaLeafCaptureSocket.cfg`.
2. In the `[Globals]` section, you can specify the port number to receive standard or SSL traffic. In the following example, standard traffic (`Port`) is captured on port `1966` and forwarded to the `DataDrop` session agent. SSL traffic (`SSLPort`) is captured on port `1967` and forwarded to the `DecoupleSSL` session agent:

   ```
   Port=1966:DataDrop
   #SSLPort=1967:DecoupleSSL
   ```

   #* For more information on configuring the IBM Tealeaf CX Passive Capture Application to send traffic to a specific port, see "Configuration" in the *IBM Tealeaf Passive Capture Application Manual*.
3. Note that the SSL pipeline is commented out (`#`), which means that it is current disabled. To enable a pipeline, remove the `#`.
4. Configure the `[firewall]` section. See “Configuring firewall settings” on page 219.
5. For the standard traffic port pipeline, the `DataDrop` session agent initiates the pipeline. Search the file for the following string: `[DataDrop]`.
6. In the Data Drop session agent, configure all session agent settings, including the following configuration item:

   ```
   DownStreamConfigSection=DecoupleEx
   ```

   #* The settings for individual session agents are described elsewhere. For a list of available session agents, see “Overview of the Capture Pipeline and Session Agents” on page 224.

7. The DownStreamConfigSection property indicates the next session agent to which to pass the data outputted from DataDrop. If you search the file for the following string: [DecoupleEx], you will see another DownStreamConfigSection property, which points to the next session agent, and so on.
8. In this manner, you can build your pipeline until you reach one of the terminal pipeline session agents:
   a. [Canister] session agent forwards the session data to a Tealeaf Short Term Canister. See "Canister Session Agent" on page 236.
   b. [Archive] session agent writes the session data to a Tealeaf Archive File (TLA) on the server's hard drive. See "Archive Session Agent" on page 227.
   c. [Null] session agent discards the data. For debugging purposes.
   d. You can also point the end of a pipeline to the start of the next one. See "Setting up multiple pipelines" on page 220.

Configuring firewall settings: By default, the TealeafCaptureSocket process accepts connections from a remote machine, assuming it follows the Tealeaf Transport Service Protocol. The Firewall section of TealeafCaptureSocket.cfg can be used to restrict which remote capture devices are permitted to communicate with the IBM Tealeaf CX server. This section contains addresses of remote hosts allowed to send data to the Tealeaf Transport Service.

When a connection is first accepted, the sending addresses are verified against the set of addresses specified in the RemoteHosts setting. Any address not in the list is tracked, disconnected, and logged at the next ReportingInterval when logging is enabled.

The firewall settings:

- **Display Name** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **Name** values are displayed in TealeafCaptureSocket.cfg.

Table 5. Configuring firewall settings

Display Name	Name	Description
Remote Hosts	RemoteHosts	A comma-separated list of IP addresses or DSN-resolvable host names. You can also specify a range of addresses, separated by a hyphen. Any address falling within the specified range is permitted to connect. In the following example, an IP address, a DSN address, and a range of addresses are specified for acceptance:RemoteHosts=1.2.3.4, freebird2, 1.2.3.10-1.2.3.12
Reporting Interval	ReportingInterval	This setting defines the amount of time in seconds to wait between reporting on rejected connections. Configuring a valid reporting interval prevents inundating the log with reports of rejected connections when a server is attempting to reconnect multiple times. The default value is 900 seconds (15 minutes).

Table 5. Configuring firewall settings (continued)

Display Name	Name	Description
Report to Event Log	ReportToEventLog	When set to true, the rejection reporting is also written to the Tealeaf application event log. The default value is false.

Session Agent Parameters

Each session agent has parameters you can set to customize performance. Some session agents are specific to a particular capture source.

Note: Configuration options are not case-sensitive.

Parameters common to all session agents: Each session agent has a unique set of configuration options. In addition, there are some options that are common to all session agents. The following options are common to all session agents:

Setting Description

DLL Name of the Dynamic Link Library (DLL) for the session agent. If you do not provide a fully qualified path, the DLL must be in the same directory as the capture source (for example, TeaLeafIIS.dll). The following search methods are used to locate session agent DLLs:

- search for the DLL using the path specified in the capture pipeline configuration file
- search for the DLL in the current directory (for example, the same directory as the capture configuration file
- search for the DLL using the TEALEAFPATH environment variable
- search for the DLL using the PATH environment variable

TypeName
Identifies the session agent type. This should not normally be changed.

DownStreamConfigSection
Indicates the next component in the pipeline. This is a required field for all pipeline session agents except Archive, Socket, and Null, which can terminate a pipeline and therefore do not require the DownStreamConfigSection setting.

Setting up multiple pipelines

If your web application passes content over standard protocols and over SSL, you may wish to create a dedicated pipeline to handle the SSL traffic first, before it is passed through the standard pipeline for processing. This pipeline might be responsible for the removal of sensitive information. When the pipeline has completed its manipulations, it can then forward to the pipeline that handles standard traffic for general pipeline activities.

1. Create the SSLPort pipeline.
2. Specify all of the session agents needed for the SSL-only traffic.
   - Typically, the SSL pipeline strips out any sensitive information. See "Privacy Session Agent" on page 291.
3. When you have created the chain of SSL-only session agents, set the following value in the final one:

   ```
   DownStreamConfigSection=Socket
   ```

4. In the [Socket] section, specify the following properties to point to the start of the standard pipeline. If you are using a port that is not 1966, insert that value in the location below:

```
Server=localhost
Port=1966
UseSSL=False
```

5. Create the second pipeline for port 1966 in standard fashion.
6. When you have created both pipelines, SSL traffic is passed through the SSL pipeline first, which then forwards it to the port=1966 pipeline for standard processing.

Initial Pipeline Configuration

Note: This section provides a framework for performing the initial configuration of one component of the IBM TealeafCX system in a simplified deployment model. Depending on your Tealeaf solution's deployment, additional configuration may be required. If you have any questions about configuration, please contact http://support.tealeaf.com.

After the PCA and Windows server software has been installed, in most configurations, the Windows Pipeline requires little configuration in order to be operational.

Non-default Listen Ports

If you have configured the PCA to deliver to HBR or the Processing Server over a port that is not 1966, you must configure the recipient to listen on the appropriate port number. Pipeline listening ports are defined through the Pipeline Editor in the Tealeaf Management System. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

1. Before you begin, you should determine if you need to use SSL to transmit between the PCA and the Windows pipeline. See “Configuring PCA and Processing Servers to Use SSL” on page 223 below.
2. Login to the Tealeaf Portal as an administrator.
3. To open the "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*, select **Tealeaf** > **TMS** from the Portal menu.
4. In Servers view, click the Transport Service node.
5. Click **Transport Service configuration**.
6. In the Config actions, click **View/Edit**. The Pipeline Editor is displayed.
7. Select the top node of the pipeline. Its name should be Pipeline:1966 in a default configuration.
8. Click **Edit** at the bottom of the window.
9. In the Edit Pipeline Settings dialog:
   a. Enter the port number on which the Processing Server should listen for this pipeline.
   b. If using SSL between the PCA and the Processing Server, select the Use SSL checkbox.
10. Click **Apply**.
11. To close the Pipeline Editor, click **Save**.

Configure Privacy

Note: Before you enable capture, you may need to configure privacy rules to prevent the unwanted capture of sensitive information, such as customer credit card numbers. If capture is enabled without appropriate privacy rules, unfiltered customer data may be forwarded to the Windows pipeline and stored in the Tealeaf databases, where it can be searched by any Tealeaf user with the appropriate permissions.

Tealeaf privacy enables the manipulation, masking, or removal of sensitive information in the request or response traffic. Based upon privacy rules that you configure, this data can be hidden in the traffic that is stored in the Tealeaf database. For more information on privacy, see "Managing Data Privacy in Tealeaf CX" in the *IBM Tealeaf CX Installation Manual*.

During the initial configuration, privacy rules and actions are typically defined at the earliest point in the capture and processing of session data, which occurs at the PCA. By blocking all private data through the PCA, you can be assured that no sensitive information is ever available in the system.

- For more information on managing privacy in the PCA, see "PCA Web Console - Rules Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
- For more initial configuration steps for PCA-based privacy, see "Initial PCA Configuration" in the *IBM Tealeaf Passive Capture Application Manual*.

Depending on the volume and type of privacy rules enacted at the PCA and the overall volume of traffic, the PCA server may be unable to keep up with all captured hits and may be forced to drop hits. In these instances, to relieve the processing burden on the PCA, you may choose to move some of the privacy rules processing to the Windows pipeline, which is managed on a different server from the PCA.

- Other issues may cause hits to be dropped at the PCA. For more information, please contact http://support.tealeaf.com.
- The PCA server and each Processing Server can be configured to transmit encrypted data, if that additional layer of security is needed. See “Configuring PCA and Processing Servers to Use SSL” on page 223.

In the Windows pipeline, privacy is managed by including the Privacy or Extended Privacy session agents in your pipeline configuration. Through either of these two session agents, you can define the same privacy rules and actions that are available in the PCA.

Attention: In multi-pipeline environments, do not enable the extended privacy session agent (`PrivacyEx`) for child pipelines that have HBR enabled. If HBR and `PrivacyEx` are enabled for a child pipeline, the service can run out of memory and cause the service to restart unexpectedly. For more information about `PrivacyEx`, see “Extended Privacy Session Agent” on page 261.

- Extended Privacy session agent is the recommended session agent. See “Extended Privacy Session Agent” on page 261.
- For more information on privacy rules and actions, see “Privacy Session Agent” on page 291.
- Privacy is configured through the Pipeline Editor available in TMS. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring PCA and Processing Servers to Use SSL

If your security environment requires the secure transmission of data between the PCA server and each Processing Server, please complete the following steps.

Note: There may be a performance impact with using SSL to transmit between servers.

1. Before you begin, you must acquire the text of the private key that you wish to use between the servers. The key is `.PEM` file and placed in the Tealeaf folder of the processing machines. The PCA queries a copy of the web certificate and then use that certificate to encode the data before transmitting.
2. To configure SSL transmission on the PCA:
   a. Open the PCA Web Console. See "Passive Capture Configuration via Web Console" in the *IBM Tealeaf Passive Capture Application Manual*.
   b. Click the "PCA Web Console - Delivery Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
   c. Click the edit button next to the target that is receiving data from the PCA.
   d. In the configuration, click the Enable Secure Delivery checkbox.
   e. In the displayed window, paste in the content of the private key.
   f. Click **OK**. See "PCA Web Console - Delivery Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
3. To configure SSL transmission in the Windows pipeline:
   a. Login to the Tealeaf Portal as an administrator.
   b. To open the "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*, select **Tealeaf** > **TMS** from the Portal menu.
   c. In Servers view, click the Transport Service node.
   d. Click **Transport Service configuration**.
   e. In the Config actions, click **View/Edit**. The Pipeline Editor is displayed.
   f. Select the top node of the pipeline. Its name should be `Pipeline:1966` in a default configuration.
   g. Click **Edit** at the bottom of the window.
   h. In the Edit Pipeline Settings dialog, select the Use SSL checkbox.
   i. Click **Apply**.
   j. To close the Pipeline Editor, click **Save**.

Health-Based Routing

The Health-Based Routing (HBR) session agent can be deployed to manage load balancing and failover in environments with multiple Processing Servers. Before processing is enabled, HBR must be added to your pipelines, and you must configure HBR to recognize and forward an appropriate volume of data to each Processing Server in the environment. See “Health-Based Routing (HBR) Session Agent” on page 263.

- HBR is not necessary in single canister environments.

Data Drop

If you are encountering performance issues in your Windows pipeline, you may choose to deploy the Data Drop session agent, which can be configured to drop unnecessary data. For example, you can configure Data Drop to drop binary images, which are data-intensive and may not be useful. Data Drop is typically deployed early in the pipeline in order to streamline processing of data.

- See “Data Drop Session Agent” on page 241.

Testing Your Configuration

After you have completed your initial configuration, you can perform the following steps to verify the configuration.

When you have completed the configuration of a basic pipeline, TMS provides the mechanism for reviewing the pipeline processing. Use the steps below to verify pipeline operations.

Note: A more complete set of tests can be executed after all Tealeaf components have been configured. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

1. Login to the Tealeaf Portal as an administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. Click the Pipeline Status tab.
4. From the Pipelines textbox, select the pipeline that you just configured if multiple pipelines are available.
5. In the upper-right panel, you can review the session agents currently configured in the pipeline. Verify that hits are being passed between session agents for delivery. See "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
6. If the pipeline is delivering the hits to a Tealeaf Canister, you can search the Canister for active sessions. Those active sessions should have hits being added to them. You may find it useful to open a session of your own on the web application being monitored by Tealeaf. As you navigate around the web application, you may be able to track your activities as an active session. See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.

When all Tealeaf components are configured, you should complete an end-to-end test. See "Testing Your Tealeaf Solution" in the *IBM Tealeaf CX Configuration Manual*.

Overview of the Capture Pipeline and Session Agents

The Capture Pipeline consists of a series of modules called **session agents**. Each session agent controls part of the capture process.

Depending on the type of pipeline, the set of useful session agents may vary:

- The Transport Service pipeline can use all of the session agents below.
- The IIS Capture filter pipeline should normally be limited to Decouple and Socket session agents.

About Session Agents

Session agents can be added and configured through the TMS Pipeline Editor. See “Adding a Session Agent” on page 226.

Available Session Agents

Table 6. Available Session Agents

Agent Name	Agent Token	Description
“Archive Session Agent” on page 227	`[Archive]`	Saves captured data to disk as TLA files.

Table 6. Available Session Agents (continued)

Agent Name	Agent Token	Description
"Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*	`[AttrIndexer]`	Captures session attribute information and inserts into IBM Tealeaf cxReveal database.
"Canister Session Agent" on page 236	`[Canister]`	Sends session data to the Short Term Canister.
"Cookie Parser Session Agent" on page 238	`[CookieParser]`	Enable ease of searching by parsing cookies.
"Data Drop Session Agent" on page 241	`[DataDrop]`	Removes hits from specific binary requests which are of no interest.
"Data Parser Session Agent" on page 246	`[DataParser]`	Scrapes the REQ or RSP buffer for a value, then sets it into a user chosen name/value pair in the REQ [appdata] section. The found value can be operated upon by a regex and can be MD5 encoded.
"Decouple Session Agent" on page 250	`[Decouple]`	Decouples the Capture Pipeline from the main thread of the server and queues hits in memory only.
"DOM Capture Virtual Hit Session Agent" on page 254	`[DomCaptureVHit]`	Moves the captured DOM data from the UI hit into a newly created virtual hit, with the captured DOM as its response. **Note:** The **DOM Capture Virtual Hit** session agent is needed only if you are going to perform DOM capture. Additionally, if you decide to perform DOM capture, the **DOM Capture Virtual Hit** session agent must be configured after the Inflate session agent and before the Privacy session agent.
"Extended Decoupler Session Agent" on page 252	`[DecoupleEx]`	Handles sustained increases in traffic volume by regulating the volume of hits entering the Canister to prevent it from becoming overloaded.
"Extended Privacy Session Agent" on page 261	`[PrivacyEx]`	Extended `[Privacy]` session agent with checksum and MD5 hashing features.
"Health-Based Routing (HBR) Session Agent" on page 263	`[HBR]`	Dynamic router of traffic based on the health of processing servers.
"Inflate Session Agent" on page 271	`[Inflate]`	Expands data in the Capture Pipeline which has been compressed with GZIP for HTTP transfer.
"JSON Mobile Parser Session Agent" on page 275	various	Enables capture of events from native applications on mobile devices using Tealeaf Logging Frameworks. Messages submitted via JSON.
"Managed Code Session Agent" on page 287	various	Allows custom functionality written in C# or VB.NET.
"Null Session Agent" on page 290	`[Null]`	Terminates the pipeline and performs no action on the data.

Table 6. Available Session Agents (continued)

Agent Name	Agent Token	Description
"Privacy Session Agent" on page 291	[Privacy]	Provides rule-based blocking or encryption for sensitive data.
"Real-Time Monitoring and Alert (RTA) Session Agent" on page 321	[RTA]	Identifies errors in the captured data and takes one or more of the following actions: writes an event to the Windows Event Log, generates a TeaLeaf Application Event in the recorded request file, deletes the hit, or sends email.
"Response Tags to Request Session Agent" on page 326	[RSPTags2REQ]	Search response buffer for tags to add to the [appdata] section of the request.
"RTA Split Session Agent" on page 328	[RTASplit]	Used to route traffic to child pipelines.
"Sessioning Session Agent" on page 332	[Sessioning]	Uses an MD5 hash or a specified request field to generate the session ID.
"Session Router Session Agent" on page 330	[SessionRouter]	Designed for cases of simple session routing or sampling.
"Socket Session Agent" on page 335	[Socket]	Transfers captured data to another machine through a TCP/IP network.
"Statistics Logger Session Agent" on page 337	[StatsLogger]	Manages the assembly and insertion of hit statistics into the Statistics database.
"Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*	[TLTRef]	Normalizes some hit information, such as URL, server, host, and application.
"Tealeaf Sessioning Session Agent" on page 360	[TLSessioning]	Sessionizes in the pipeline for the non-simple cases.
"TimeGrades Session Agent" on page 366	[TimeGrades]	Assigns a grade to a hit in the following three areas: Page Generation time, RoundTrip time, and Network time.
"TLI Session Agent" on page 368	[TLI]	Captures static content and inserts into TLI files stored on the TLI Server.
"URL Decode Session Agent" on page 382	[URLDecode]	Converts characters in the URL request that are represented in hexadecimal data to ASCII characters.

Adding a Session Agent

Session agents can be added, configured, and removed from your pipelines through the Pipeline Editor in TMS. This graphical interface enables rapid development, deployment, and testing of pipelines and individual session agents while eliminating potential configuration errors.

- For a summary of each session agent, see "Overview of the Capture Pipeline and Session Agents" on page 224.
- For more information on specific session agents, please use the links below.

1. Login to the Tealeaf Portal as an administrator.

2. Select **Tealeaf** > **TMS**.
3. Click the Transport Service node.
4. Click **Transport Service configuration**.
5. In the Actions panel, click **View/Edit**.
6. The Pipeline Editor is displayed.
   - To add a session agent to your pipeline, drag it from the Available Session Agents panel and drop it on the top of the pipeline. The session agent is added.
     – You can drag and drop it within the list of session agents in the pipeline to reposition.
     – When you add or move a session agent, the configuration changes to connect the session agents within a pipeline are handled for you.
   - To edit a session agent in the pipeline, select it.
     – To edit the selected instance of the agent, click **Edit**.
     – To rename the selected agent, click **Rename**. Enter a new name and press ENTER.
   - To remove a session agent from a pipeline, drag it from the pipeline to one of the right-hand panels. If you wish to save the session agent, drop it in the Saved Session Agents panel.

Archive Session Agent

The Archive session agent saves captured data to disk. The resulting files are named as follows:

```
TLT_MachineName_ID_GMT_YYYYMMDD_StartTime_EndTime.ext
```

Note: The Archive session agent is a terminating session agent, so the `-DownStreamConfigSection` option is not required.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See "Adding a Session Agent" on page 226. For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Settings

Setting Description

`MachineName`
The name of the server capturing the data

`ID` Identifies the type of captured data. `YYYYMMDD` is the date on which the capture took place within the archive file.

`StartTime and EndTime`
Represents in Greenwich Standard Mean Time the first and last pages in the captured data contained in the archive file. `EndTime` includes milliseconds.

ext The user-specified file extension.

Configuration Settings

The following configuration settings are available:

- **Display Name** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **Name** values are displayed in `TealeafCaptureSocket.cfg`.

Table 7. Archive Session Agent

Display Name	Name	Description
`Archive Prefix`	`FileID`	Sets the ID that appears in the TLA filename so that the type of capture for a file is easier to identify. Specify this value as follows: `FileID=id` where `id` is the capture type description you want to add to your archive filename. Examples of FileID names are `Web` and `BusinessEvent`.
`Max Archive Size`	`MaxLogSize`	Specifies the maximum size of the archive TLA file in bytes. The default is 32 MB. Valid values can be entered as follows: • number • numberKB to specify the `number` of Kilobytes • numberMB to specify the `number` of Megabytes • numberGB to specify the `number` of Gigabytes **Note:** The minimum size of an archive TLA file is 10 MB.
`Archive Directory`	`LogDirectory`	Specifies the directory in which data files are stored. Files are stored in `C:\temp` by default.
`Archive Roll Time`	`RollTime`	This comma-delimited list specifies the times in 24-hour Greenwich Mean Time (GMT) to close the current archive file and create a new one. The following example creates a new log file at 1:00 AM, 4:30 AM, and 5:00 PM GMT every day: `RollTime=01:00, 04:30, 17:00`

Table 7. Archive Session Agent (continued)

Display Name	Name	Description
Disk Quota Scan Interval	QuotaScanTime	Specifies the time interval in seconds when the disk quota check should occur. Valid values range from 20 to 3600 (twenty seconds to sixty minutes). For example, you might set QuotaScan Time as follows: QuotaScanTime=60 The minimum QuotaScanTime is 20.
Disk % Free	QuotaPctFree	Specifies the percent free threshold for the directory specified using the QuotaDir option. If the amount of free space falls below this threshold, the Capture Filter disables itself to avoid consuming too much disk space. • On Microsoft Windows NT 4.0, the directory disk space is the same as overall disk space. • On Microsoft Windows 2000 or higher, you can establish directory quotas.

Tealeaf Session Agents

- "Adding a Session Agent" on page 226
- Archive Session Agent
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Canister Session Agent" on page 236
- "Cookie Parser Session Agent" on page 238
- "Data Drop Session Agent" on page 241
- "Data Parser Session Agent" on page 246
- "Decouple Session Agent" on page 250
- "Extended Decoupler Session Agent" on page 252
- "Extended Privacy Session Agent" on page 261
- "Health-Based Routing (HBR) Session Agent" on page 263
- "Inflate Session Agent" on page 271
- "JSON Mobile Parser Session Agent" on page 275
- "Managed Code Session Agent" on page 287
- "Null Session Agent" on page 290
- "Privacy Session Agent" on page 291
- "Real-Time Monitoring and Alert (RTA) Session Agent" on page 321
- "Response Tags to Request Session Agent" on page 326
- "RTA Split Session Agent" on page 328
- "Sessioning Session Agent" on page 332
- "Session Router Session Agent" on page 330
- "Socket Session Agent" on page 335

- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- “Tealeaf Sessioning Session Agent” on page 360
- “TimeGrades Session Agent” on page 366
- “TLI Session Agent” on page 368
- “URL Decode Session Agent” on page 382

Attribute Indexing Session Agent

The Attribute Indexing session agent can be deployed to retrieve session attribute information from Tealeaf event data and to insert that content into the IBM Tealeaf cxReveal database (`TL_SEARCH`).

- This session agent is deployed in a Windows pipeline that receives event data through the Tealeaf Event Bus enabled and configured on each Processing Server in the environment.

  Note: The Tealeaf Event Bus is a component of cxConnect for Data Analysis, a separately licensable component of the Tealeaf CX platform. please contact your IBM Tealeaf representative.

Available through IBM Tealeaf cxReveal, the IBM Tealeaf cxReveal database enables Tealeaf users to quickly locate Tealeaf sessions in any state of capture and processing by searching for session attributes. Session attributes may be specified as soon as the first hit is evaluated in the Windows pipeline. For example, the value for the login identifier is typically set to populate the `SessionAttribute00` attribute as soon as the visitor logs into the web application. When the first session attribute is detected by the session agent, a new record for the session is inserted into the IBM Tealeaf cxReveal database.

Note: The cxReveal database is a component of cxReveal, a separately licensable component of the Tealeaf CX platform. please contact your IBM Tealeaf representative.

This database record can be immediately queried and retrieved through Portal search by IBM Tealeaf cxReveal users, which enables them to quickly locate visitor sessions as needed.

Since these visitor records are stored in a single SQL Server database, search and retrieval of visitor information is very fast.

Note: The deployment of multiple IBM Tealeaf cxReveal servers is supported for higher volume web applications.

Pre-Requisites

Note: This section describes how to configure the IBM Tealeaf cxReveal server and pipeline for capture of session attributes. To enable the end-to-end solution for session attribute capture, search, and replay, additional configuration is required in the Portal. Before you begin, you should review the other configuration steps.

1. **IBM Tealeaf cxImpact:** The attribute indexing session agent is available through IBM Tealeaf cxImpact.

2. **IBM Tealeaf cxConnect for Data Analysis:** The capture of session attribute information from each Canister requires the use of the Tealeaf Event Bus to send events to the designated pipeline for capture.
3. **IBM Tealeaf cxReveal:** The IBM Tealeaf cxReveal database is a component of IBM Tealeaf cxReveal, a separately licensable product of the IBM Tealeaf CX system.
   - IBM Tealeaf cxReveal requires a separate installation on each IBM Tealeaf cxReveal server.
   - Enabling session attribute search requires additional configuration.

Note: The Attribute Indexing session agent should not be deployed in a Windows pipeline where other processing occurs. This session agent requires a dedicated Windows pipeline and a separate IBM Tealeaf cxReveal server.

Installing cxReveal: Before you begin, the Tealeaf Transport Service and the IBM Tealeaf cxReveal database must be installed on each IBM Tealeaf cxReveal server.

The IBM Tealeaf cxReveal database may be installed separately on the same system using the Tealeaf Database Manager.

Configuration Workflow

The basic architecture for attribute indexing pipelines is to split content from one of your existing Windows pipelines and to send the content to a Windows pipeline on the IBM Tealeaf cxReveal Server for insertion of session attribute information into the IBM Tealeaf cxReveal database.

1. If you have not done so already, you must install the Processing Server and IBM Tealeaf cxReveal database on each dedicated IBM Tealeaf cxReveal Server. Multiple deployment models are supported for the IBM TealeafcxReveal database.
2. As part of the install process, a default pipeline is created. It contains the minimum session agents to capture and insert session attribute information into the database, including the Attribute Indexing session agent.
3. Configure the parameters of the Attribute Indexing session agent. See "Configuring Attribute Indexing Session Agent" on page 233.
4. In the main Windows pipelines that are sending hits through the Event Bus to the Processing Server managing attribute indexing, enable the Event Bus and configure the Event Bus.
5. After the Event Bus has been enabled and tested locally, the Event Bus pipeline must be configured to send Tealeaf events to the destination system.
6. Repeat the Event Bus configuration for each Processing Server to send events to the IBM Tealeaf cxReveal Servers.
7. After you have completed the configuration steps, you may test capture as soon as data has arrived at the pipeline.

Attribute Indexing processing pipeline:

In the following sections, you can review the minimum pipeline configuration required to enable capture of session attributes. These are minimum requirements. The pipeline required for your Tealeaf environment may vary.

Note: The IBM Tealeaf cxReveal Installer configures the following default pipeline for use. If this pipeline meets your needs, additional configuration may not be required. You may wish to review the available parameters for the session agent.

The pipeline that is used to capture session attributes and insert them into the IBM Tealeaf cxReveal database requires the following minimum configuration:

```
DataDrop > DecoupleEx > SessionRouter > AttrIndexer > Null
```

Tealeaf recommends using the `DecoupleEx` pipeline session agent. `DecoupleEx` enables spooling of hits into the pipeline during overloaded conditions, such as when a broad search is being executed. When the `DecoupleEx` session agent is deployed, statistical information on the pipeline performance can be surfaced in the Portal.

Avoid using `Decouple` in the IBM TealeafcxReveal Search pipeline.

Note: The Attribute Indexing session agent must be configured so that its downstream session agent is the Null session agent.

Note: In almost all environments, Tealeaf Privacy rules are not necessary for this pipeline, as the terminating session agent is the `Null` session agent. If privacy is required to meet your security requirements, you may insert the Privacy session agent or Extended Privacy session agent after the `Decouple` session agent in the above pipeline.

Adding the Session Agent: Session agents can be added through the Pipeline Editor in TMS.

Configuring the Event Bus

The Tealeaf Event Bus enables the delivery of Tealeaf events to other systems or pipelines for offline analysis or use.

Note: The Tealeaf Event Bus is a component of cxConnect for Data Analysis, a separately licensable component of the Tealeaf CX platform. please contact your IBM Tealeaf representative.

Before you deploy the session agent, you should complete the following configuration tasks on each Processing Server in the environment sending event data for capture by the session agent:

1. Enable the Event Bus.

   Note: When enabling the Event Bus, do not include the response data. Since the Attribute Indexing session agent collects session-level information only, including individual response data consumes unnecessary bandwidth to transfer to the IBM Tealeaf cxReveal server.
2. Enable the Event Bus pipeline local to the Processing Server hosting it.
3. Configure the Event Bus pipeline.
4. Test the Event Bus pipeline by writing event data to a Tealeaf archive.

These steps are documented in the Event Bus documentation.

Minimum Event Bus Pipeline:
After the Event Bus has been enabled, configured, and tested on each Processing Server submitting event data for capture, you can configure the Event Bus pipelines to forward data to the machine dedicated to capturing session attribute data.

1. From the Portal menu, select **Tealeaf** > **TMS**.
2. Click the WorldView tab.

3. From the Server drop-down, select one of the Processing Servers sending data to the session attribute machine.
4. Click the Canister node.
5. Click **Event Bus configuration**. In the Config Actions pane, click **View/Edit**.
6. The Event Bus pipeline is displayed in the Pipeline Editor.
7. During testing, you may have deployed one of the following session agents as the last one in the pipeline (the **terminal session agent**).
8. When you are ready to send data to the session attribute capture machine, replace the terminal session agent with the Socket session agent.
9. Drag and drop the terminal session agent in the pipeline to the Available Session Agents pane.
10. Drag and drop the Socket session agent from the Available Session Agents pane to be the last session agent in the pipeline.
11. The pipeline should look something like the following:

    ```
    Decouple > <other_agents> > Socket
    ```

    where:
    `<other_agents>` - may be zero or more session agents, depending on your Event Bus requirements.
12. Configure the Socket session agent.
13. Save your changes.
14. Push the changes to other servers.
15. Repeat these configuration changes to each Event Bus on the Processing Servers in your environment.

Configuring the Socket Session Agent:

This session agent terminates all Event Bus pipelines that send event data for further processing by another pipeline.

The following settings need to be configured for the Event Bus pipeline for each Processing Server delivering events.

Setting Description

`Port` Set this value to the port used by the pipeline that is capturing attribute information on the IBM Tealeaf cxReveal server.

`Server` Set this value to the hostname of the IBM Tealeaf cxReveal server.

Configuring Attribute Indexing Session Agent

After you have configured the pipeline to capture session attribute information, you must configure the Attribute Indexing session agent in the pipeline.

This session agent scans content for user-defined session attributes. When new attribute values or changes to attribute values are detected, the session agent uses the available session information to attempt to locate the session record in the IBM Tealeaf cxReveal database.

- If there is no match with an existing record, a new session record is inserted into the database.

Settings: When the Windows pipeline is installed, the session agent configuration items are specified for you.

Note: Do not change values for the available configuration settings other than the settings listed below.

Setting Description

LogLevel
Set the log level for the session agent.

RolloverHour
Define the hour when a new database table is created to store the captured session attributes for the day.

MasterPipeline
One pipeline must be configured as the master pipeline for maintenance purposes. If you are using only one pipeline to capture session attributes, set this value to `true`.

Logging:
The Attribute Indexing session agent can be configured to generate logging information.

To enable logging:

1. In the Attribute Indexing session agent, you must configure the `LogLevel` value to one of the following values:
   - `status`
   - `info`
   - `warn`
   - `error` (default)
   - `debug`

   Note: Use the `debug` level only for troubleshooting specific issues. When the issue has been resolved, reset to a lower level.
2. Save changes.

Log files are written to the main Tealeaf log directory.

The following log is written from the session agent.

```
<Tealeaf_install_directory>\Logs\
TLSessionAgentAttrIndex_PipelineId_YYYYMMDD.log
```

where:

- `PipelineId` - identifies the port number for the pipeline. Typically, this value is `1966` or `1967`.
- `YYYYDDMM` - date stamp

This log receives status information from the session agent once per minute.

```
<Tealeaf_install_directory>\Logs\
RevealStatus_YYYYMMDD.log
```

where:

- `YYYYDDMM` - date stamp

Log fields:

The following fields are displayed in the `RevealStatus` log file, which are updated once per minute.

- Log files are updated from the master pipeline only on each IBM Tealeaf cxReveal server.

Field(s)
Description

RevealStatus
Current status of the connection to the IBM Tealeaf cxReveal database (`up` or `down`)

RevealDownReason
If status is `down`, this field indicates the reason.

SessionsUpdated
Number of Tealeaf sessions that were updated in the past minute with new or changed session attributes.

HitsSkippedAttributesUnchanged
Number of hits that were skipped in the past minute because there were no new or updated session attributes.

SearchAttribute1 - SearchAttribute5
The session attributes that are currently configured to be searchable.

- IBM Tealeaf cxReveal supports up to five searchable session attributes. The attributes available for IBM Tealeaf cxReveal search are defined through the Event Manager.

TrackedAttribute1 - TrackedAttribute32
The session attributes that are currently configured to be tracked.

- IBM Tealeaf cxReveal supports tracking in the database of up to 32 session attributes. The attributes available for IBM Tealeaf cxReveal tracking are defined through the Event Manager.

Downloading logs:
Log files may be downloaded through the Portal Management page.

1. In the Portal menu, select **Tealeaf** > **Portal Management**.
2. Click the Manage Servers link.
3. Select the server hosting the Attribute Indexing session agent and IBM Tealeaf cxReveal capture pipeline.
4. Click the Tealeaf Logs icon in the toolbar.
5. In the Filter By drop-down, select `SA Session Attribute`. Click **Refresh**.
6. Click the link of the log file you wish to download. Log filenames should be in the following format:
   `TLSessionAgentAttrIndex_YYYYMMDD.log`

Testing Capture of Attributes

This section describes how to test the capturing of session attributes.

Check the Pipeline:
Through TMS, you can verify that the pipeline is operating in the Pipeline Status tab.

1. From the Portal menu, select **Tealeaf** > **TMS**.
2. Click the **Pipeline Status** tab.
3. From the **Server** menu, select the server where the session attributes are evaluated.

4. Verify that the proper pipeline is selected in the Pipelines panel.
5. In the upper-right pane, you can review the character and hit counts passed through each session agent.

   Non-zero values indicate that the pipeline is capturing content.

Verify Search: The best way to test capture of session attributes is to perform a search through the Portal using the IBM Tealeaf cxReveal template for Active sessions.

Note: To enable search, additional configuration is required. See "Configuring Session Attribute Search" in the *IBM Tealeaf cxReveal Administration Manual*.

- If sessions are returned, then the session agent is capturing session attributes and creating valid records in the IBM Tealeaf cxReveal database.
- See "cxReveal - Searching Sessions by Session Attribute" in the *IBM Tealeaf cxReveal User Manual*.

Tealeaf Session Agents

- Attribute Indexing Session Agent
- Canister Session Agent
- Cookie Parser Session Agent
- Data Drop Session Agent
- Data Parser Session Agent
- Decouple Session Agent
- Extended Decoupler Session Agent
- Extended Privacy Session Agent
- Health-Based Routing (HBR) Session Agent
- Inflate Session Agent
- JSON Mobile Parser Session Agent
- Managed Code Session Agent
- Null Session Agent
- Privacy Session Agent
- Real-Time Monitoring and Alert (RTA) Session Agent
- Response Tags to Request Session Agent
- RTA Split Session Agent
- Sessioning Session Agent
- Session Router Session Agent
- Socket Session Agent
- Statistics Logger Session Agent
- Tealeaf Reference Session Agent
- Tealeaf Sessioning Session Agent
- TimeGrades Session Agent
- TLI Session Agent
- URL Decode Session Agent

Canister Session Agent

This session agent is the interface to the Tealeaf datastore. Captured data is compressed, sessionized and inserted into the datastore.

Note: For some deployments of the Processing Server, this session agent is included in the default pipeline and is required. See “CX Pipeline Configuration” on page 214.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

SA Global Settings

The following settings are available for this session agent.

Setting Description

`TypeName`
This option should be set to `Canister`.

`DLL` Specifies the name of the canister session agent: `SessionAgentCanister.dll`. You must specify the full path if the `.DLL` is not in the same directory as the capture filter.

`CanisterPath`
Name of the database into which the captured data is stored. CanisterPath should be set to `CANISTER.dbs` as follows: `CanisterPath=CANISTER.dbs`.

`CanisterSrvr`
Name of the canister server. CanisterSrvr should be set to `FAIRCOMS` as follows: `CanisterPath= FAIRCOMS`.

Canister Safety Limits

Tealeaf provides a set of controls to set the maximum size of a session in terms of hits, bytes, or duration. These controls can be configured through Advanced Mode in the Event Manager.

- See "Tealeaf EES Tutorial" in the *IBM Tealeaf Event Manager Manual*.

Compression Settings

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 8. Canister Session Agent

Display Name	Name	Description
Compression Type	CompressionType	Controls how the captured data is compressed: • 0 - no compression is performed. • 1 - compress only the response file. • 2 - compress both the request and response files. The default setting is 2.

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Cookie Parser Session Agent

To enable easy searching, the CookieParser session agent parses cookies appearing after the HTTP_COOKIE value in the request into name-value pairs. Cookie data is placed at the bottom of the request in a section entitled [cookies]

The following is an example:

```
[cookies]
TLTSID=CF37A9C511D67E7F03003785F87C9647z0
TLTHID=CF37A9C511D67E7F03003785F87C9647
TLTUID=CC50ED7C11D67E1C90003B95BC7A8A27
SITESERVER=ID=3c576155747d32c21e27fa781a689ac7
TLT_NumCookies=4
TLT_CookiesBytes=165
```

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See "Adding a Session Agent" on page 226.

- For more information on the Pipeline Editor, see "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuration Settings

The following configuration settings are available:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 9. Cookie Parser Session Agent

Display Name	Name	Description
`Cookie Delimiter`	`CookieDelimiter`	Delimiter used in Cookies header. The default value is `;`.
`Extract`	`Extract`	Allows for the extraction of sub-values from a cookie value. The default value is `YES`.
`Fragment Delimiter`	`FragmentDelimiter`	Used in conjunction with the Extract option, this setting specifies cookie fragment delimiter. The default value is `` ` ``.
`URL Decode`	`URLDecode`	Specifies if the cookie value should be URL-decoded. The default value is `YES`.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Cookie Delimiter

The Cookie Parser allows users to denote their own cookie delimiter, which allows a wider range of cookie formats to be processed.

- If no delimiter is provided, then the semicolon (`;`) character is used.
- If you use more than one character, the cookie parser uses only the first char in the string as the delimiter.
- "Avoid Using Ampersand as a Delimiter" on page 240

- To denote your own delimiter, add the following to the CookieParser section of the configuration file:

  ```
  CookieDelimiter=<somechar>
  ```

Avoid Using Ampersand as a Delimiter

Avoid using the ampersand (&) character as a delimiter. This character is commonly used to denote fragments within a parent cookie, such as the following:

```
HTTP_COOKIE=TLTUID=567683546&id=1234&page=0; TLTRUID=234567;
```

Which would typically result in the following:

```
TLT_NumCookies=2
TLT_CookiesBytes=48
TLT_NumCookieFragments=2
TLT_CookieFragmentBytes=15
```

However, using ampersand (&) as the delimiter generates the following:

```
TLT_NumCookies=3
TLT_CookiesBytes=48
TLT_NumCookieFragments=0
TLT_CookieFragmentBytes=0
```

Note the incorrect figures above.

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Data Drop Session Agent

This session agent deletes unwanted data. DataDrop typically sits between CSS and the Extended Decoupler session agent, so data is deleted before it passes through the Decoupler. This positioning significantly reduces the size of spool files.

Note: For some deployments of the Processing Server, this session agent is included in the default pipeline and is required. See "CX Pipeline Configuration" on page 214.

Overview

Below is a rough description of the DataDrop decision tree for deciding whether to keep a hit, in the order of evaluation. If a hit passes one test, the next test in the sequence is evaluated:

- If the hit is a round-trip hit, drop it only if the KeepRoundTripHits option is `false`.
- If DelImages is set to `YES` and the hit is an uninteresting binary hit, then drop it.
- If the hit is from the IBM Tealeaf CX RealiTea Viewer, then drop the hit if the KeepRealiTeaViewerHits option is `false`.
- If one of the custom drop rules matches the hit, then drop the hit.
- Keep the hit and pass it on to the next session agent.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See "Adding a Session Agent" on page 226. For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 10. Configuration Settings

Display Name	Name	Description
`DelImages`	`DelImages`	Enable DelImages actions, such as deleting images or other binary hits. The default value is `YES`. • See "DelImages" on page 242.

Table 10. Configuration Settings (continued)

Display Name	Name	Description
Keep RealiTea Viewer Hits	KeepRealiTeaViewerHits	Retain hits generated by the session viewer. The default value is NO. • See "KeepRealiTeaViewerHits."
Keep RoundTrip Hits	KeepRoundTripHits	Retain hits used to estimate round-trip times. The default value is YES. • See "KeepRoundTripHits."
Log Statistics	LogStatistics	Enable logging of statistics. The default value is NO. • See "LogStatistics" on page 243.
Statistics Logging Interval	LogStatisticsInterval	Time in seconds between statistics logging. The default value is 3600 seconds (one hour). • See "LogStatisticsInterval" on page 243.
DataDrop Rule	Drop	See "Custom Drop Rules" on page 243.

DelImages

By default, the DelImages option enables the DataDrop session agent to remove uninteresting binary hits. Set DelImages to YES to drop these kinds of hits.

Typically, an uninteresting hit references a common binary or configuration file that does not contain information of interest to Tealeaf. An uninteresting hit has the following properties:

- Capture type: 3
- Status code: 200-299 or 304
- URL field does not have a suffix specified by the KeepSuffixes setting.

Note: Beginning in PCA Build 3502, this functionality can be enabled in the PCA pipeline, which limits the volume of data that is processed and transmitted to the Processing Servers. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

KeepRealiTeaViewerHits

Set KeepRealiTeaViewerHits to YES if you want to keep hits from RealiTeaViewer.

A hit from RealiTeaViewer is one where the HTTP_USER_AGENT field is set to RealiTeaViewer or TealeafFileGetter.

- By default, KeepRealiTeaViewerHits is set to NO.

KeepRoundTripHits

Set KeepRoundTripHits to YES if you want to keep round-trip hits for processing by RoundTrip.Action.tcl.

A round-trip hit is defined when the TealeafRoundTrip field is set to YES.

- By default, KeepRoundTripHits is set to YES.

LogStatistics

Set LogStatistics to YES if you want statistics on dropped hits written to a tab-delimited file.

The statistics file is prefixed with SADataDropStats and is written to the same directory as the session-agent log.

- By default, LogStatistics is set to NO.

LogStatisticsInterval

Set LogStatisticsInterval to the number of seconds to wait before writing statistical information to the session agent's statistics file.

- By default, LogStatisticsInterval is 86400, which corresponds to the number of seconds in one day.

Custom Drop Rules

The following sections document the various configuration options specific to SessionAgent DataDrop. These options should be placed in the capture source's configuration file.

In addition to the pre-configured drop rules, you can define up to 100 custom rules that select hits to drop.
To define a rule, add a Drop rule to the configuration section, as in the following example:

```
Drop1=reqfield url contains /company/\
```

The DataDrop session agent loads rules Drop1 through Drop100 and evaluates them in that order.

You can specify the following types of rules.

- REQFIELD rules match the values of fields in the request buffer. See "REQFIELD rules."
- REQSECTION rules test for the existence of text in a specified section of the request buffer. See "REQSECTION rules" on page 244.
- REQUEST and RESPONSE rules test for the existence of text in the request or response buffers, respectively. See "REQUEST and RESPONSE rules" on page 245.

REQFIELD rules

These rules are in the following format:
REQFIELD NAME OPERATOR TEXT MODIFIER
Where:

- NAME is the case-sensitive name of the field variable you want to examine.
- OPERATOR is one of the following operators:

  CONTAINS EQ GE GT LE LT NE PARTOF

  Operator
  Description

  CONTAINS
  field value contains TEXT value. e.g. URL value contains .asp.

EQ field value equals TEXT value

GE (numeric fields only) field value is greater than or equal to TEXT value

GT (numeric fields only) field value is greater than TEXT value

LE (numeric fields only) field value is less than or equal to TEXT value

LT (numeric fields only) field value is less than TEXT value

NE (numeric fields only) field value is not equal to TEXT value

PARTOF field value is one entry in the list of TEXT values. Values must be semicolon-separated. For example, the state abbreviation CA is a subset of the list CA;OR;WA;HI;AK.

Note: Matches are entire string matches. Partial matches are not supported.

See "Example PARTOF Configuration" on page 245.

You can negate the above operators with NOT. For example:

```
NOT CONTAINS
NOT GE
```

- TEXT is the text you want to use with the operator.
- MODIFIER is an optional keyword that tells the operators to ignore or match the case of the field value and text. For example:

  ```
  REQFIELD remote_host EQ server1 IGNORECASE
  REQFIELD remote_host EQ ExactServer MATCHCASE
  ```

  – If you do not specify MODIFIER, then the operators ignore the case of the letters in the value and text.

To include spaces in the name or text, surround the name or text with quotation marks. For example:

```
reqfield "name with spaces" contains "text with spaces"
```

If both the field value and the text can be evaluated as numbers, then the following operators perform numeric tests:

```
EQ GE GT LE LT NE
```

Otherwise, both the value and text are treated as text.

REQSECTION rules

These rules have the following format:

```
REQSECTION NAME CONTAINS TEXT MODIFIER
```

where:

- NAME Name of the section you want to search.
- TEXT is the text for which you are looking.
  – This value may also be a delimited list.
- MODIFIER The same optional keyword as in REQFIELD.

You can negate the CONTAINS operator with NOT. For example:

```
REQSECTION env NOT CONTAINS 10.20.40.50
```

REQUEST and RESPONSE rules

These rules have the following forms:

```
REQUEST CONTAINS TEXT MODIFIER
RESPONSE CONTAINS TEXT MODIFIER
```

where:

- TEXT is the text for which you are looking.
  - This value may also be a delimited list.
- MODIFIER is the same optional keyword as in REQFIELD.

You can negate the CONTAINS operator with NOT. For example:

```
RESPONSE NOT CONTAINS "something went wrong"
```

Sample Configuration

Full Configuration

The following configuration sample is taken from the TealeafCaptureSocket.cfg file on the Processing Server.

Note: TMS is the preferred method for configuring Windows pipelines. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

```
[DataDrop]
...
DelImages=YES
KeepRealiTeaViewerHits=YES
KeepRoundTripHits=YES
LogStatistics=NO
LogStatisticsInterval=3600
Drop1=reqfield URL contains /company/
Drop2=reqfield HTTP_USER_AGENT contains bot
Drop3=reqfield URL contains /coMPany/ IGNORECASE
Drop4=reqsection env contains CaptureType=2
Drop5=response contains "cache-control: private"
```

Example PARTOF Configuration

In the example below, the drop rule has been specified to drop the hit if the request field (reqfield) called PCA_NAME contains one of the listed values: ceres, io, or pluto.

```
Drop6=reqfield PCA_NAME partof ceres;io;pluto
```

This request field is contained in the [env] section of the request and is assigned by the IBM Tealeaf CX Passive Capture Application that captured the hit. This example configuration might be useful if you have one or more development instances of the IBM Tealeaf CX Passive Capture Application, whose data you do not wish to capture and process through the Windows pipeline.

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Data Parser Session Agent

The Data Parser session agent is a general-purpose "search and grab" pipeline agent that scrapes either the REQ or RSP buffers of a hit for user-defined patterns. These patterns can then be manipulated.

Like the Privacy session agent, rules can be created for the Data Parser session agent to allow name/value pairs to be appended to sections in the REQ buffer. When values are found in either the request or the response, the following types of operations can be applied to the found value:

- A regular expression
- An MD5 hash
- Found values can be concatenated or listed with a delimiter

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226. For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring Template Rules

After the session agent has been added to a pipeline through the Pipeline Editor, you can configure the Data Parser search templates through TMS. To edit:

1. In TMS, select the WorldView tab.
2. Select Servers view.
3. Open the Transport Service node.
4. Click **DataParser Search Templates**.
5. In the Config Actions pane, click **View/Edit**.
6. The search templates are displayed. See “Building Data Parser Rules.”

Configuration Settings

When the Data Parser session agent is added to the pipeline, the following session agent settings can be modified to significantly affect its performance and behavior.

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 11. Configuration Settings

Display Name	Name	Description
`Max Tag Length`	`MaxTagLength`	This setting represents the number of characters collected after the pattern is matched if no end tag or regular expression is provided. Minimizing this value is important for optimizing speed. The default value is `1024` characters.
`Config File`	`ConfigFile`	This path identifies the file containing rules to apply to the Data Parser. If this path is not found, the session agent does not load.
`Storage Name`	`StorageName`	This user-defined section name in the request buffer indicates where created name/value pairs are inserted. If it is not specified, the created values are automatically inserted into the `[appdata]` section, which is created if none exists. Inserting data into the `[appdata]` section allows indexing of the new values.

Building Data Parser Rules

For the Data Parser session agent, you can create rules in the `DataParserSearchTemplates.cfg` file, or whatever file is specified in the ConfigFile property for the Data Parser configuration.

- You can edit this file through the Transport Service node in TMS. See “Configuring Template Rules” on page 246.

Rule configuration options

There are several possible permutations to DataParser rules:

Setting Description

Action For all rules in DataParser, the Action **must** be set to `Search`. This setting avoids confusion with other types of actions allowed by other session agents.

SearchType
The search type can have one of two values: `Single Pass` or `XML`.

- `Single Pass` uses normal text searching methods to collect strings from the buffer.
- `XML` uses a separate XSL transform to do all data manipulation. XSL transforms are powerful but very slow to execute. XSL usage is not recommended in high-traffic environments.

DisplayName
This setting is the name used in the name/value pair, if the pattern is found.

SearchString
This setting is the pattern for which you wish to search in the buffer. StartPattern can also be used.

Regular expression
Denotes the regular expression used, if the SearchString pattern is found.

- `regular expression=` and `regex=` are recognized in rules configuration.
- Look-behind expressions of un-fixed length are not supported.

  If you need to use an expression like `(?<=start).*end`, then you must denote the number of chars you want to capture explicitly. Example:

  ```
  (?<=start).
  {1,200}
  end
  ```

  Note: If a regular expression is supplied and does not match the text found after the SearchString is found, no name/value pair appears in the REQ buffer.

SearchURL
The URL on which to fire for this action.

- If no SearchURL is specified, the action fires on all hits.

EndTag Denotes an end tag character sequence that terminates the collection of characters. You can use an end tag and a regular expression to collect and then clean up a character string. EndPattern can also be used.

MD5 Set this value to `True` to apply MD5 to the final value, after the regular expressions and end tags are applied.

Note: Only the value is MD5-encoded. The DisplayName is not.

Section
This setting denotes whether to search the REQ or RSP buffer. Only two case-sensitive values are accepted: `Response` or `Request`. If no value is provided, the RSP buffer is used by default.

DelimMatches
When set to `True`, Data Parser puts all the matches found under the Display Name delimited by comma by default. You can provide a different delimiter in the Delimiter setting.

Delimiter
The user-defined delimiter used when DelimMatches is set to `True`. If it is not specified, the delimiter is set to comma.

Note: If multiple search patterns are found from the same rule, the DataParser numbers them and puts them in the REQ buffer in the order they are found. For example, if multiple `Title` searches returned results, the output looks like the following:

```
Title=firstfind
Title2=secondfind
Title3=thirdfind
```

RegGroup

Optionally, you can specify the output and format of the regular expression matching based on groups in the regular expression. For example, if the regular expression is `(tom)(/sis)(/s.)(*)`, then specifying `RegGroup={g1}={g2}` returns the value `tom= is`. In this case, the second equals sign (=) is a literal and is passed through to the output.

Values are returned in the order they are found in the buffer.

Example rules

Get Title rule

The following example rule for Data Parser Session Agent uses a single-pass search on the RSP buffer for the `<title>stuff</title>` tag of an HTML document. If found, it then applies a regular expression to acquire the content inside the tags and to apply the value to the `Title` parameter in the request buffer:

```
[Title]
Action=Search
SearchType=SinglePass
DisplayName=Title
SearchString=<title>
Regular expression=<title.*</title>
```

Get Tealeaf User ID rule

This rule uses a single-pass search on the request buffer to find `TLTUID=`. If it is found, the name/value pair consists of `TLTUID_MD5=` and everything to the next carriage return. An MD5 hash is applied to the value.

```
[TLTUID]
Action=Search
SearchType=SinglePass
DisplayName=TLTUID_MD5
SearchString=TLTUID=
EndTag=\r
MD5=True
Section=Request
```

Apply XSL to Request buffer rule

This rule applies the `ClientEventXSL.xsl` transform file to transform the REQ buffer. Note the DisplayName parameter is set to `none`. While DisplayName parameter is a required part of a well-formed rule, the XSL denotes the name of the name/value pair, and this parameter is not used.

```
[ClientXSL]
Action=Search
SearchType=XML
DisplayName=None
SearchString=ClientEventXSL.xsl
Section=Request
```

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Decouple Session Agent

The Decouple session agent decouples the capture pipeline from the socket receiving component and the remainder of the pipeline and throttles traffic spikes using an in-memory queue. For example, if there was a burst of traffic that exceeds the capacity of the remaining pipeline agents, the Decouple session agent queues this burst on the in-memory queue so that no hits are lost.

Unlike Extended Decouple, this session agent operates in-memory only and cannot spool hits to disk when volume is high. Consequently, this session agent is much simpler to configure. There is only one configuration option, the size of the in-memory queue.

Note: If the number of hits in memory exceeds the maximum queue size, subsequent hits are dropped and lost. This session agent is not intended for any extended queuing periods. It can be used only to smooth bursts of traffic lasting a minute or two.

Note: Extended Decouple includes additional features and configuration options that are not available in Decouple session agent. For any envisioned extended queuing that lasts longer than two minutes, you should consider deploying the Extended Decouple session agent. See “Extended Decoupler Session Agent” on page 252.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226. For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Settings

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 12. Decouple Session Agent

Display Name	Name	Description
`Max Queue Size`	`MaxQueueSize`	Specifies the maximum number of hits the memory queue can hold. Increasing the memory queue size increases competition for memory resources. The default value is `2500`.

Mobile-Related Session Agents

This session agent can be used as part of capturing and processing JSON messages submitted from one of the Tealeaf client frameworks and splitting these messages into separate hits in the Windows pipeline. This method is the legacy method. These client framework versions were introduced in Release 8.4 and have been superseded by the step-based method of messaging, beginning in Release 8.5. For more information on these client frameworks, including implementation steps, please use the links below:

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- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- “Tealeaf Sessioning Session Agent” on page 360
- “TimeGrades Session Agent” on page 366
- “TLI Session Agent” on page 368
- “URL Decode Session Agent” on page 382

Extended Decoupler Session Agent

The Extended Decoupler session agent in the Capture Socket Service pipeline manages sustained increases in traffic volume. For websites with sustained increases in traffic volume in the first part of the day or at the end of each month, this session agent is crucial.

Hit volume entering the Short Term Canister is regulated to prevent the STC from becoming overloaded. By queuing data in this manner, IBM Tealeaf CX greatly reduces the loss of data at any point in the pipeline.

Note: For some deployments of the Processing Server, this session agent is included in the default pipeline and is required. See “CX Pipeline Configuration” on page 214.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Extended Decoupler Process

The Extended Decoupler monitors the Short Term Canister's vital statistics and compares them to the predefined thresholds for the session agent. When a threshold has been exceeded, Extended Decoupler begins to store hits in a queue. Hits are first queued in memory. When the memory queue reaches its capacity, hits are then queued to disk.

Since the Short Term Canister is an in-memory database, it can sustain volumes above capacity for only 10 to 50 minutes. Beyond this range, the Canister begins paging to disk for extra memory. Paging forces a decrease in the rate at which the Short Term Canister accepts hits, until its capacity is restored.

Draining the Short Term Canister

Draining the Short Term Canister refers to when one or more of the thresholds used to monitor STC health is exceeded, and the Extended Decoupler begins the queuing process to let the Canister process the existing session data.

For example, if the maximum number of unevaluated hits reaches a threshold, the Extended Decoupler begins queuing hits, which allows the Short Term Canister to drain its store of unevaluated hits: aggregating hits into sessions, sending interesting hits to the Long Term Archive, and deleting non-interesting session data.

The Extended Decoupler monitors the following thresholds to determine whether the Canister needs to drain:

- ctree cache usage level
- processing unevaluated hits
- processing sessions waiting to be archived
- processing sessions waiting to be indexed.

The Extended Decoupler keeps track of the hit arrival rate and the hit departure rate as hits pass through the capture socket pipeline into the Canister. If the Canister is healthy, hits pass through without being queued. The health of the Canister is determined by examining the following conditions in the Short Term Canister:

- Number of unevaluated hits versus evaluated hits
- Number of sessions waiting for long term archive
- Number of sessions waiting to be indexed
- Maximum percentage of Faircom Cache used

Each of the above values is configurable. The size of the values depends greatly on the size of the computer on which the IBM Tealeaf CX Server is installed. These values are given equal priority.

- If one value is over the threshold, Extended Decoupler stops sending hits to the Canister and begins queuing hits until the minimum threshold value is reached. For example, when the Short Term Canister size is greater than 1 GB, queuing may begin, and hits are queued until the STC size is less than 500 MB.

After the system has regained healthy status, the Extended Decoupler sends queued data into the Canister at an outflow rate specified in the session agent configuration settings. The outflow rate acts as a governor on data flow so hits don't immediately overflow the Canister.

Reporting

After Extended Decoupler has gone through the queuing cycle and released hits back into the Canister, hourly reporting is skewed because the Canister looks at the time stamps of when data arrives in the Canister and not when it was originally captured. However, daily reports tallying total hits is not affected by the hourly skewing.

Logging

The Extended Decoupler creates a log file in tab-separated format, which can be imported into other applications such as Excel.

The log file also logs CPU usage on the Canister machine for current, last 10 minutes, and last hour metrics.

DOM Capture Virtual Hit Session Agent

Moves the captured DOM data from the UI hit into a newly created virtual hit, with the captured DOM as its response.

After the virtual hit is created, the original DOM capture data is removed from the JSON and replaced with an empty string.

Note: The **DOM Capture Virtual Hit** session agent is needed only if you are going to perform DOM capture.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See "Adding a Session Agent" on page 226. For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

If you are planning to use DOM capture, it must be configured after the Inflate session agent and before the Privacy session agent in `TealeafCaptureSocket.cfg`. For example:

```
[Inflate]
TypeName=Inflate
DLL=SessionAgentInflate.dll
UnReqCancelled=True
MaxInflateSize=1536KB
DownStreamConfigSection=DomCaptureVHit

[DomCaptureVHit]
TypeName=DomCaptureVHit
DLL=SessionAgentDomCaptureVHit.dll
DownStreamConfigSection=PrivacyEx
```

Extended Decoupler Configuration

The Extended Decoupler configuration options are grouped into the following categories:

- "Global Settings" on page 255
- "Short Term Canister Thresholds" on page 257
- "DecouplerEx Reporting" on page 258

- "DecouplerEx Disk Settings" on page 259
- **Display Name** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **Name** values are displayed in `TealeafCaptureSocket.cfg`.

Global Settings

Note: Extended Decoupler always runs in `EXTENDED` mode, in which spooling is always enabled. To disable spooling, use the Decoupler session agent. See "Disabling Disk Queuing" on page 260.

Table 13. Global Settings

Display Name	Name	Description
`Control Outflow Rate`	`ControlMaxOutRate`	Turns on the parameter that controls the rate at which hits flow from the queue to the Canister. Values are either `ON` or `OFF`. When set to `ON`, you must also configure the MaxOutMode, MaxOutHitsPerSec, and MaxOutBytesPerSec settings.
`Max Outflow Hits Per Second`	`MaxOutHitsPerSec`	Specifies the rate at which hits flow from the queue to the Canister. This value is defined as hits per second. The appropriate value depends on the hardware configuration of the IBM Tealeaf CX Server.
`Max Outflow Bytes Per Second`	`MaxOutBytesPerSec`	Specifies the rate in bytes per second that hits flow from the queue to the Canister.
`Outflow Control Mode`	`OutflowControlMode`	Specifies the mode to meter queue outflow rates. The following settings measure hit flow rate queue output: • `Hits` meter to the MaxOutHitsPerSec setting. • `Bytes` meter to the MaxOutBytesPerSec setting. • `Both` meter to the threshold of either the MaxOutHitsPerSec or MaxOutBytesPerSec setting. The following settings measure hit flow rate at the Canister input: • `CANHITS` meter to the MaxOutHitsPerSec setting. • `CANBYTES` meter to the MaxOutBytesPerSec setting. • `CANBOTH` meter to the threshold of either the MaxOutHitsPerSec or MaxOutBytesPerSec setting.

Table 13. Global Settings (continued)

Display Name	Name	Description
Persistence	Persistence	Specifies if there are spooled files and the Extended Decoupler is stopped. After a restart, this setting enables the Extended Decoupler to continue processing the spooled files created during a previous queue of files.
Spool At Startup	SpoolAtStartup	The equivalent of issuing a StartQ command from Search Server on startup.

Calculating and Configuring the Outflow Rate

To properly throttle the session agent, you must configure the appropriate data outflow to avoid some of the following problems:

- Canister unable to process hits to meet the incoming rate
- Running out of memory address space in the Short Term Canister
- ctree memory limit configured to close to the maximum address space
- Spooling

Use the steps below to configure the outflow rate.

1. Before you configure the session agent, you must acquire the maximum available memory in the Short Term Canister. This value is displayed as the `Max Ctree Bytes` setting in the Services Controls tab of the Canister configuration in TMS.
   - Write this value down for later use.
   - See "Configuring the CX Canister" on page 18.
2. In the Short Term Canister Thresholds section of the Extended Decouple session agent configuration, review the value for `Canister Max % Memory Used`.Write this value down.
3. In the Globals section of the Extended Decouple session agent configuration, set `ControlMaxOutRate` to `ON`. When set to `ON`, basic throttling of hits to the canisters is enabled.
4. Configure the `Outflow Control Mode` setting, which manages how the session agent manages the maximum outflow rate. Set this figure to `Bytes`, which pegs the outflow rate to the `Max Outflow Bytes Per Second` setting.
5. Set `Max Outflow Hits Per Second` to `1000`.
6. Set `Max Outflow Bytes Per Second` to the following formula:

   ```
   Max Ctree Bytes * Canister Max % Memory Used +
      (Max Outflow Hits Per Second *60)
   ```

   - For `Canister Max % Memory Used`, convert the value to a decimal. For example, a figure of 85% is inserted into the formula as `0.85`.
   - If this value is greater than `Max Ctree Bytes` value, then set the value to `Max Ctree Bytes - 1`.

Note: Do not attempt to set the outflow rate to a value greater than the maximum available bytes in any destination Short Term Canister.

- For 32-bit systems, Tealeaf does not support the use of the `/3GB` operating system switch.

- Using a 64-bit operating system enables access to more memory for the Short Term Canister.

Short Term Canister Thresholds

The following Short Term Canister thresholds are compared with the Canister statistics that are polled by the Statistics service and stored in shared memory. This polling occurs every 30 seconds.

If any of these thresholds is breached, the TealeafCapture Socket service stops sending hits to the Canister and begins queuing hits.

- If the CanCheckEventLog setting is `ON`, messages appear in the event application log when a Canister threshold has been exceeded.

  Note: These threshold settings must take into account the size of the systems on which they are installed. Thresholds that are set too low cause the Canister to stop accepting hits too often and interrupt traffic flow. Thresholds that are too high may cause data to overflow the Canister's memory.

Table 14. Short Term Canister Thresholds

Display Name	Name	Description
`Canister Check`	`Cancheck`	Enables checking of the Canister.
`Canister Logging`	`CanCheckLog`	Outputs Canister statistics to a log file whose location is specified by the LogDir setting
`Canister Max % Memory Used`	`CanCheckMaxCtreeMemUsedPct`	Maximum allowed percentage of memory allocated by the Tealeaf Canister Server. When set to `0`, the cache value is ignored, and the CanCheckMinCtreeMemUsedPct setting is also ignored.
`Canister Min % Memory Used`	`CanCheckMinCtreeMemUsedPct`	Specifies the minimum percentage of FairCom Cache in use. • This value is checked only if the CanCheckMaxCtreeMemUsedPct setting is enabled. • If the maximum value has been exceeded, the Extended Decoupler queues hits until the minimum value is reached.
`Max Unevaluated Canister Hits`	`CanCheckMaxUnevalHits`	If the number of un-evaluated hits in the Canister exceeds this number, the Canister health is compromised.
`Min Unevaluated Canister Hits`	`CanCheckMinUnevalHits`	Specifies the minimum number of unevaluated hits. When the maximum value is reached, the Extended Decoupler queues hits until the minimum value is reached. If CanCheckMaxUnevalHits is set to `0`, this setting is ignored.

Table 14. Short Term Canister Thresholds (continued)

Display Name	Name	Description
Max Sessions Waiting for LTC	CanCheckMaxSesnWaitForLtc	If the number of sessions waiting to be archived exceeds this value, the Canister health is compromised.
Min Sessions Waiting For LTC	CanCheckMinSesnWaitForLtc	Specifies the minimum threshold of sessions waiting to be archived. When the maximum threshold has been exceeded, Extended Decoupler queues until the minimum number has been reached.
Max Sessions Waiting For IDX	CanCheckMaxSesnWaitForIdx	If the number of sessions waiting to be indexed exceeds the specified number, the Canister health is compromised.
Min Sessions Waiting for IDX	CanCheckMinSesnWaitForIdx	Specifies the minimum threshold of sessions waiting to be indexed. When the maximum threshold has been exceeded, Extended Decoupler queues until the minimum number has been reached.
Drain STC on Error	CanCheckDrainSTCOnError	When a maximum threshold is surpassed, the Extended Decoupler signals to the Canister to close all sessions and drain the Canister without waiting for the session timeout. The default value is OFF.

DecouplerEx Reporting

DecouplerEx has several settings that determine the output for and enable DecouplerEx statistics.

Table 15. DecouplerEx Reporting

Display Name	Name	Description
Log Directory	LogDir	Specifies the Log directory. If the Log, StatsMeter, or CanCheckLog setting is enabled, logging occurs in this directory. The default value is the global Tealeaf log directory.

Table 15. DecouplerEx Reporting (continued)

Display Name	Name	Description
Report Statistics	StatsMeter	Enables or disables the statistics meter. The **statistics meter** monitors the rate of hits or bytes that enter and exit the Extended Decoupler. The number of bytes per second that are entering the Extended Decoupler can be used to calculate the amount of data sent to the Short Term Canister. Reports are output in text format to the directory specified by the LogDir setting. You can also define the log format. .CSV is recommended for spreadsheet import.
Write Stat Report To Log File	StatsMeterLogToFile	Specifies whether to output statistics meter reports to the log file. The default value is ON.
Generate Stats Hits	StatsMeterHits	Controls statistics hits. The default value is OFF.
Log	Log	Turns logging on or off. The default value is ON.
Log Level	LogLevel	Specifies the Log level of detail. Possible values are: Error, Warning, Info, and Debug. The default value is Debug. • Log levels are inclusive. For example, Info includes Warning and Error.

DecouplerEx Disk Settings

This group of settings control the queue size, the amount of time the Extended Decoupler should spool to the disk, and the amount of data to spool. You can also configure the amount of space to leave free on the disk as a percentage. The quota mechanism used here is the same as the one used for the Archive session agent.

Table 16. DecouplerEx Disk Settings

Display Name	Name	Description
Max Memory Queue Size	MaxQueueSize	Specifies the maximum number of hits the memory queue can hold. The **memory queue** is designed to handle brief spikes in hit flow. Hits are queued on disk when memory queue is exhausted. Increasing the memory queue size increases competition for memory resources. The default value is 5000.
Spool File Roll Size	SpoolRollSizeMB	Specifies the maximum size of each spool file in megabytes. The default value is 500 MB.

Table 16. DecouplerEx Disk Settings (continued)

Display Name	Name	Description
Spool Directory	SpoolDir	Specifies the directory location in which to write the spool file. The default value is the Spool subdirectory in the install directory.
Spool Write Chunk Size	SpoolChunkSizeMB	The size of chunks to write when spooling data, in megabytes.
Disk % Free	DiskQuotaPctFree	Specifies the percent free threshold for the directory specified in the QuotaDir option. If the amount of free space falls below this threshold, the Capture Filter disables itself to avoid consuming too much disk space. • On Microsoft Windows NT 4.0 systems, the directory disk space is the same as overall disk space. • On Microsoft Windows 2000 or higher, you can establish directory quotas. The default value is 2 percent.

Disabling Disk Queuing

A lightweight predecessor to the Extended Decoupler session agent, the Decoupler session agent uses an in-memory queue for queuing up hits for processing and does not queue any hits to disk. If the in-memory queue is filled, hits are dropped. Extended Decoupler session agent is configured to always queue sessions to disk if the in-memory queue is filled.

The configuration settings for Decoupler session agent is a subset of those in Extended Decoupler session agent. You can add the session agent through the Pipeline Editor and adjust the size of the in-memory queue (Max Queue Size).

See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Tealeaf Session Agents

- “Adding a Session Agent” on page 226
- “Archive Session Agent” on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Canister Session Agent” on page 236
- “Cookie Parser Session Agent” on page 238
- “Data Drop Session Agent” on page 241
- “Data Parser Session Agent” on page 246
- “Decouple Session Agent” on page 250
- Extended Decoupler Session Agent
- “Extended Privacy Session Agent” on page 261
- “Health-Based Routing (HBR) Session Agent” on page 263
- “Inflate Session Agent” on page 271

- “JSON Mobile Parser Session Agent” on page 275
- “Managed Code Session Agent” on page 287
- “Null Session Agent” on page 290
- “Privacy Session Agent” on page 291
- “Real-Time Monitoring and Alert (RTA) Session Agent” on page 321
- “Response Tags to Request Session Agent” on page 326
- “RTA Split Session Agent” on page 328
- “Sessioning Session Agent” on page 332
- “Session Router Session Agent” on page 330
- “Socket Session Agent” on page 335
- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- “Tealeaf Sessioning Session Agent” on page 360
- “TimeGrades Session Agent” on page 366
- “TLI Session Agent” on page 368
- “URL Decode Session Agent” on page 382

Extended Privacy Session Agent

The PrivacyEx session agent enables the encryption, blocking, and replacement of text in the request and response buffers.

Like its predecessor, Privacy, this session agent utilizes a flexible set of rules and configuration options to ensure that sensitive data is treated in an appropriate manner. For more information on how to configure the rules, actions, and tests in use, see “Privacy Session Agent” on page 291.

Attention: In multi-pipeline environments, do not enable the extended privacy session agent (`PrivacyEx`) for child pipelines that have HBR enabled. If HBR and `PrivacyEx` are enabled for a child pipeline, the service can run out of memory and cause the service to restart unexpectedly. For more information about `PrivacyEx`, see “Extended Privacy Session Agent.”

The PrivacyEx session agent extends the older Privacy session agent with the following features:

- **Faster buffer search:** PrivacyEx can search a request or a response once for all terms for which it is trying to filter.
- **Internationalization support:** PrivacyEx can be used to filter data in a variety of international encoding schemes.
- **MD5:** If needed, you can apply MD5 hashing to the output of a privacy rule.

Note: Where possible, use PrivacyEx session agent instead of Privacy, which may be deprecated in future releases.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Settings

The following configuration settings are available for the session agent:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 17. Extended Privacy Session Agent

Display Name	Name	Description
`Config File`	`ConfigFile`	The name of the file containing the rules and actions in use by PrivacyEx session agent. Default value is `Privacy.cfg`, which is used by the Privacy session agent, too.
`Show Rules in Event Log`	`LogRules`	When set to `true`, PrivacyEx session agent lists the rules and actions in use in the Tealeaf application event log.
`Log Level`	`LogLevel`	When enabled and defined, the log level setting defines the logging level of messages inserted into the request in the `[privacylog]` section. The following log levels are accepted: • `Error` - reports Errors only • `Warning` - reports Errors and Warnings • `Info` - reports Errors, Warnings, and Info messages • `Trace` - reports above messages, plus additional information for tracing • `Debug` - reports maximum information **Note:** The `Debug` logging level should only be enabled when you are debugging issues with rules and actions. The additional data inserted into the request may cause a significant increase in data volume and decrease in performance. Additionally, unencrypted original data values may be logged at `Debug` level. When you have finished debugging, remember to reset the logging level.

Tealeaf Session Agents

- “Adding a Session Agent” on page 226
- “Archive Session Agent” on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Canister Session Agent” on page 236
- “Cookie Parser Session Agent” on page 238
- “Data Drop Session Agent” on page 241
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- “Sessioning Session Agent” on page 332
- “Session Router Session Agent” on page 330
- “Socket Session Agent” on page 335
- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- “Tealeaf Sessioning Session Agent” on page 360
- “TimeGrades Session Agent” on page 366
- “TLI Session Agent” on page 368
- “URL Decode Session Agent” on page 382

Health-Based Routing (HBR) Session Agent

Health-Based Routing (HBR) is a pipeline agent that monitors the health of the downstream canisters and can dynamically route sessions to those canisters based upon their health. HBR requires a minimum of 2 processing servers (HBR does not make sense for a single processing server) and can monitor up to a maximum of 20 processing servers.

Note: For some deployments of the Processing Server, this session agent is included in the default pipeline and is required. See “CX Pipeline Configuration” on page 214.

HBR determines the processing server health by communicating with the processing server SearchServer and gets the Governor/Canister status (i.e., `http://processingserver:19000/GovernorStatusEx`); Processing server health is determined if the processing server is spooling, if it is not spooling HBR assumes that it can continue to take traffic for existing sessions and new sessions. If HBR determines that the processing server is spooling, then it will continue to send

traffic for existing sessions (HBR tries to maintain session fidelity per canister) but will not start any new sessions for that processing server till it has recovered from its spool condition.

This section describes how to add and configure the Health-Based Routing session agent.

Note: If you selected to install HBR during through the Tealeaf installer, HBR is automatically configured for you. This section is useful if you are adding HBR or modifying an existing HBR after installation is complete.

Prerequisites

Note: A local instance of Search Server must be started before HBR is initialized. HBR uses Search Server to perform a Governor Status assessment on the local machine. Both services are available through the Canister Services utility (`CanSvcs.exe`), which should be used to start and stop these services.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See "Adding a Session Agent" on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

The following configuration settings are available for HBR.

Table 18. Configuration Settings

Display Name	Name	Description
`Maximum Amount of Sessions`	`MaxSessions`	Indicates the maximum number of concurrent sessions that HBR needs to monitor. HBR maintains a session table to track the canister for that session, this indicates how big to make the session table (sessions kept/removed per LRU methodology).
`Global Default Hits Per Second Per Canister`	`DefaultPerSecMax`	The global number of hits/sec per canister (for 5 canisters and with the default of 200, HBR will throttle traffic to 1000 hits/sec). This global value can be overridden per canister with the CanisterPerSecMaxX directive.
`HBR Rules PreProcess TCL Script`	`PreProcScript`	Path to the HBR rules Pre-Process TCL Script.

Table 18. Configuration Settings (continued)

Display Name	Name	Description
Health Routing Method	RoutingMethod	Indicates how HBR should route traffic. HBR can route traffic in two ways, 1) "equal" indicating that it should equally balance traffic among the target processing machines, 2) "biased" indicating it should as much traffic as possible to the first canister and should it become unhealthy then fallover to the second canister and so forth.
StartUpRouting	StartUpRouting	The fallback routing method should HBR somehow be unable determine routing. This is a highly unlikely event, but an instance where it could occur is if TeaLeafCaptureSocket.cfg in the [DecoupleEx] section was not configured with "SpoolAtStartUp=True", so that at service startup traffic would hit the HBR session agent before it had a chance to poll the target canisters for their health.
Script Trace	ScriptTrace	Script tracing enables tracking of session agent activities, which is useful for debugging.
Large Session Deletion Time Period in Seconds	LargeSessionTimePeriodSecs	Sets the amount of time in seconds wherein a certain number of hits are recorded. Ex. LargeSessionTimePeriodSecs=10, the time period being measured in this example is 10 seconds.
Large Session Deletion Hits Within Time Period	LargeSessionTimePeriodHits	Determines the number of hits that occur within a certain number of seconds. Ex. LargeSessionTimePeriodHits=500, the number of hits retained in a 10-second time period is 500. Once 500 hits have been reached, HBR will delete any remaining hits for that session.
Large Session Deletion Required Field	LargeSessionReqField	A way to exempt a session from deletion. For example, when using LargeSessionReqField=URL, then a specific string within the URL will determine which session is exempt from deletion.

Table 18. Configuration Settings (continued)

Display Name	Name	Description
Large Session Deletion Required Value	LargeSessionReqValue	The specific value within a field that will exempt a session from deletion. If any hit in a session meets these two criteria, LargeSessionReqField and LargeSessionReqValue, and if a particular field (in this case, the URL) contains a specific string, then the session is exempt from deletion regardless of whether it met the LargeSessionTimePeriodSecs and LargeSessionTimePeriodHits values. Take for example, LargeSessionReqValue=ReO. If the URL contains ReO (case insensitive), then that session is exempt from deletion.

Per Processing Server

For each processing server:

Table 19. Configuration Settings

Display Name	Name	Description
Canister Name	CanisterName	Machine name (or IP address) of the processing server to monitor.
SearchServer Port	CanisterSSPort	Port number for the SearchServer on the target Canister machine (default is 19000).
Canister Pipeline ID	CanisterPipeID	Associated with HBR are the child pipelines (the PipelineConfig* parameter) and this ties the canister to the child pipeline (this number is the * in PipelineConfig* parameter).
CanisterAppName	CanisterAppName	Specifies the AppName parameter of the associated HBR_Pipeline*.cfg (each AppName must be unique). HBR uses this value when parsing the GovernorStsEx to find the correct entry.
Canister Down Times	CanisterOffline	Scheduled Canister down times. "Daily at 2300 for 10 minutes winddown 20 minutes" indicates that at 10:40PM no new sessions (existing sessions only), 11:00PM no traffic whatsoever, resume all traffic at 11:10PM". An optional format would be "Tuesday at 2300 for 10 minutes winddown 20 minutes" indicating that it would be offline every Tuesday at this time.

Table 19. Configuration Settings (continued)

Display Name	Name	Description
HBR Initialization Time Out value	InitTimeOut	Specifies the amount of time (in seconds) that HBR will spend during initialization. Initialization can be time consuming in cases where there is a large amount of spool files.

Determining HBR Health

HBR works through Search Server, which provides the DecoupleEx status of local and remote machines.

Canister Health is determined primarily by whether the canister is up/down as reported by the GovernorStatus command through Search Server. If the average time on queue value is more than 30 minutes, the canister is considered in an unhealthy state. See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

How to Configure HBR

This section outlines a generalized approach to setting up HBR to work with multiple canisters in your Tealeaf environment. For every target canister, there is a 1-to-1 correlation between the `CanisterN` entries in the `[HBR]` section of `TeaLeafCaptureSocket.cfg` and the HBR child pipeline. So, configuring HBR requires the following:

- Editing the `[HBR]` section of `TeaLeafCaptureSocket.cfg`
- Editing the HBR child pipelines configurations (`HBR_PipelineN.cfg`)
- Additional tweaking of `TeaLeafCaptureSocket.cfg` and the `HBR_PipelineN.cfg`, such as making adjustments to `[DecoupleEx]` settings.

Configuring HBR Global Settings

In the `[HBR]` section of `TeaLeafCaptureSocket.cfg`, please review the following settings.

- See “Configuration Settings” on page 264.

Setting Description

`MaxSessions`
This value defines the number of rows in HBR's session table, which is the maximum number of sessions that HBR manages. When a new session arrives to HBR, the oldest one is removed. The default value is `100,000`.

Note: HBR Requires sessionized data.

`DefaultPerSecMax`
Maximum hits/sec per target canister. The default value is `300`.

`RoutingMethod`
Defines the method of routing sessions to each canister:

- `Equal` - each canister receives the same number of sessions. The default value is `Equal`.

- `Biased` - All traffic is delivered to the first canister until it can handle no more, at which the excess traffic is routed to the second canister until it can handle no more.

StartUpRouting
Routing information in the absence of Canister status.

LocalSSPort
Port number for local SearchServer. The default is the value stored in the local registry.

InitTimeOut
Time in seconds that HBR waits for initialization, which is complete after DecoupleEx is initialized. The default value is `1800` seconds (30 minutes).

HBRAppName
AppName from `.cfg` file in which the `[HBR]` section resides, which enables HBR to be in a child pipeline. The default value is `TeaLeafCSS_1966`.

Configuring HBR Settings for Individual Canisters

In the following settings, `X` indicates the index number for the canister. See "Per Processing Server" on page 266.

Setting Description

CanisterNameX
Name or IP address of the target canister.

CanisterPipeIDX
ID of the associated `HBR_PipelineX.cfg` so that HBR knows the child pipeline associated with the canister.

CanisterAppNameX
AppName value from the `HBR_PipelineX.cfg` file, so that HBR knows the Governor Status entry from the GovernorStatusEx command.

CanisterSSPortX
The search server port number for the target canister. The default value is `19000`.

CanisterPerSecMaxX
Maximum hits/sec for the target canister, which overrides the default global setting and enables the deployment of canisters with different capacities. The default value is the global default value.

CanisterSSLogX
Whether HBR requests should be logged to the Search Server log. The default value is `False`.

Canister Down Times

HBR needs to be apprised of scheduled canister down times. For each canister, you can specify the daily or weekly times when HBR should wind down usage before stopping the flow of hits to the canister, so that maintenance tasks can be performed on it.

The following configurations describe multiple scheduled downtimes for the same canister. Individual downtimes begin with the same identifier (`CanisterOffline=1`) and may be appended with a unique extension (`a`, `b`) to specify multiple downtimes.

Example configurations:

```
CanisterOffline1=Daily at 2300 for 10 minutes winddown 20 minutes
```

- Every day at 10:40 PM, stop the flow of new hits to this canister. At 11:00 PM, stop the canister for 10 minutes.

```
CanisterOffline1a=Tuesday at 0200 for 10 minutes winddown 20 minutes
```

- Every Tuesday at 1:40 AM, stop the flow of new hits to this canister. At 2:00 AM, stop the canister for 10 minutes.

```
CanisterOffline1b=Friday at 0500 for 10 minutes winddown 20 minutes
```

- Every Friday at 4:40 AM, stop the flow of new hits to this canister. At 5:00 AM, stop the canister for 10 minutes.

Disabling HBR-Canister Connections

You can disable HBR connections to individual Canisters through the HBR configuration files. However, for nonscheduled downtime, making these changes without interrupting data capture and processing may be challenging. You can use the following method instead.

Note: If you need to stop routing of hits to a Canister that is managed by HBR, you can stop the Search Server service on the target machine. When HBR is attempting to send hits to a server, it first queries Search Server. If Search Server is inactive, it does not send hits and begins rerouting hits to another Canister. Wait another 60 seconds to verify that HBR is no longer routing traffic to the Canister. You can monitor traffic flow through the HBR report. See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring HBR Child Pipeline Settings

For each destination canister, you must configure a separate child pipeline.

Note: There must be a 1-to-1 correspondence between a child pipeline and a destination Canister.

```
PipelineConfig1=HBR_Pipeline1.cfg
PipelineConfig2=HBR_Pipeline2.cfg
PipelineConfig3=HBR_Pipeline3.cfg
PipelineConfig4=HBR_Pipeline4.cfg
....
PipelineConfigN=HBR_PipelineN.cfg
```

Sample Configuration

```
[HBR]
....
MaxSessions=200000
DefaultPerSecMax=220
StartUpRouting=1:1-20; 2:21-40; 3:41-60; 4:61-80; 5:81-100
RoutingMethod=Equal
HBRAppName=TeaLeafCSS_1966
CanisterName1=utltea01
CanisterPipeID1=1
CanisterAppName1=TeaLeafHBR1
CanisterSSLog1=OFF
#CanisterOffline1=Daily at 0100 for 30 minutes winddown 15 minutes
CanisterName2=utltea02
CanisterPipeID2=2
CanisterAppName2=TeaLeafHBR2
CanisterSSLog2=OFF
#CanisterOffline2=Daily at 0100 for 30 minutes winddown 15 minutes
CanisterName3=utltea03
```

```
CanisterPipeID3=3
     ....
PipelineConfig1=HBR_Pipeline1.cfg
PipelineConfig2=HBR_Pipeline2.cfg
PipelineConfig3=HBR_Pipeline3.cfg
PipelineConfig4=HBR_Pipeline4.cfg
PipelineConfig5=HBR_Pipeline5.cfg
PipelineConfig6=HBR_Pipeline6.cfg
PipelineConfig7=HBR_Pipeline7.cfg
```

Main and Child DecoupleEx Configuration Tweaks

The following settings should be reviewed in the `[DecoupleEx]` section of the `TealeafCaptureSocket.cfg` file.

Note: Verify that each DecoupleEx spool folder is unique. Do not allow Multiple DecoupleEx instances sharing the same spool folder.

See "Extended Decoupler Session Agent" on page 252.

Setting Description

`SpoolAtStartup=True`

HBR needs approximately 15 seconds to poll the target canisters for their health. If they are healthy, HBR stops any queuing and begins sending hits.

Note: This value must be set to `true`.

`MaxOutMode=HITS`

This value defines the metric by which HBR determines throughput for individual canisters. Set this value to `HITS`.

`MaxOutHitsPerSec=10000`

This value defines the maximum number of hits of throughput for individual canisters. The entered value should account for all child pipelines, each of which feeds a canister. Set this value to a high number initially, or regulation of hit distribution is out of HBR's control.

Tealeaf Session Agents

- "Adding a Session Agent" on page 226
- "Archive Session Agent" on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Canister Session Agent" on page 236
- "Cookie Parser Session Agent" on page 238
- "Data Drop Session Agent" on page 241
- "Data Parser Session Agent" on page 246
- "Decouple Session Agent" on page 250
- "Extended Decoupler Session Agent" on page 252
- "Extended Privacy Session Agent" on page 261
- Health-Based Routing (HBR) Session Agent
- "Inflate Session Agent" on page 271
- "JSON Mobile Parser Session Agent" on page 275
- "Managed Code Session Agent" on page 287
- "Null Session Agent" on page 290
- "Privacy Session Agent" on page 291
- "Real-Time Monitoring and Alert (RTA) Session Agent" on page 321

- “Response Tags to Request Session Agent” on page 326
- “RTA Split Session Agent” on page 328
- “Sessioning Session Agent” on page 332
- “Session Router Session Agent” on page 330
- “Socket Session Agent” on page 335
- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- “Tealeaf Sessioning Session Agent” on page 360
- “TimeGrades Session Agent” on page 366
- “TLI Session Agent” on page 368
- “URL Decode Session Agent” on page 382

Inflate Session Agent

The Inflate session agent performs multiple pipeline functions, including the expansion of data compressed by a Web server for HTTP transfer. By default, this session agent is always configured as part of every pipeline.

Note: For some deployments of the Processing Server, this session agent is included in the default pipeline and is required. See “CX Pipeline Configuration” on page 214.

Note: If you are capturing IP addresses in IPv6 format, to enable indexing and searching for these addresses, you must do one of the following:

- Upgrade to PCA Build 3501 or later
- Deploy the Inflate session agent in each Windows processing pipeline.

Note: This session agent should appear before any session agent that may examine the data in the HTTP Response, including Privacy, DataParser, and RTA.

Overview

Since this session agent is typically present and placed before any of the processing session agents, Inflate session agent has been augmented with additional functionality for performance and pipeline simplicity. It can also perform the following functions:

- Unreqcancelled - This functionality can be used to identify false positives in which a request appears to have been cancelled by the visitor. Typically, this functionality can be managed by the Passive Capture Device, but it can be a burden on the CPU. When enabled through the Inflate session agent, this options allows for the offloading of this functionality, as the Inflate session agent is already working with the Response buffer.
- Internationalization - To manage localization issues, the Passive Capture Device can insert some buffer variables into the request related to internationalization. If these variables are not present, the Inflate session agent adds them. This feature requires no configuration. See "Internationalization Support" in the *IBM Tealeaf CX Installation Manual*.
- Deflate - Optionally, the Inflate session agent can be configured to deflate (compress) the HTTP response data, which is useful in pipelines that are configured to forward captured hits across the network to other servers.

  - The Inflate session agent replaces the Compress session agent, which has been deprecated.
- IPv6 Request Data - To support the indexing and searching for IPv6 addresses, the Inflate session agent inserts some request variables for IP addresses in IPv6-compatible format. See “IPv6 Request Data” on page 274.

Note: This session agent must be used if compressed data is processed by session agents other than the terminating session agents (Archive, Socket, or Null) or by the Tealeaf Session Index Program.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

The following settings are available for the Inflate session agent.

- `Display Name` values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- `Name` values are displayed in `TealeafCaptureSocket.cfg`.

Table 20. Inflate Session Agent

Display Name	Name	Description
`Replace Response On Error`	`ReplaceResponseOnError`	When set to `True`, an error encountered while decompressing a response that has a Content-Encoding of `gzip` or `deflate` causes the response body to be replaced with valid HTML containing a descriptive error message. • The default value is `True`. • When set to `False`, the original response is retained when an error occurs during decompression. **Note:** When this value is set to `False` and the decompression operation fails, the following message is inserted into the request: `InflateFailed=True`.

Table 20. Inflate Session Agent (continued)

Display Name	Name	Description
UnReqCancelled	UnReqCancelled	Request Cancelled hits occur when the IBM Tealeaf CX Passive Capture Application server cannot complete the capture. Typical reasons for a hit being Request Cancelled is if the PCA server did not receive a web server response for the browser request or if the size of the web server response did not match the size specification in the response header. In some cases, a mismatch in the response size does not indicate an incomplete response. For example, an HTML response contained a trailing </html> tag or a proper XML close tag may still be a complete response. When this setting is set to True (the default value), ReqCancelled hits examine the response for a proper closing tag. If one is found, the session agent changes the ReqCancelled value to False.
Max Inflate Size	MaxInflateSize	This setting specifies the maximum response size to which this session agent inflates a deflated or compressed response. This setting is a pipeline safety limit to prevent inflation of very large responses. The default value is 1536 KB.
Default Encoding	DefaultEncoding	When Mode is set to deflate, this value indicates the default encoding scheme to apply to the decompressed text. The default value is iso-8859-1.
Compression Level	CompressionLevel	When Mode is set to deflate, this value indicates the level of compression to use when compressing. Compression levels range from 1 (least) to 9 (most). The default value is 5.
Mode	Mode	This setting defines the operating mode of the session agent. • Inflate - Inflate session agent decompresses HTTP response data. • Deflate - Inflate session agent compresses HTTP response data. If neither value is explicitly specified, the session agent operates in Inflate mode.

IPv6 Request Data

Beginning in Build 3501, the IBM Tealeaf CX Passive Capture Application supports the capture of IP addresses in IPv4 and IPv6 format. Depending on the detected format, IP addresses are written into an IPv6-compatible format into the following request variables:

- `IPV6_REMOTE_ADDR`
- `IPV6_LOCAL_ADDR`

If these variables are not present in the request, the Inflate session agent automatically inserts them.

These request variables are then indexed for search purposes, enabling the searching for IPv4 or IPv6 addresses through a single search field.

- For more information on these request variables, see "Support for IPv6" in the *IBM Tealeaf CX Installation Manual*.
- For more information on end-to-end support for IPv6 in Tealeaf, see "Support for IPv6" in the *IBM Tealeaf CX Installation Manual*.

Tealeaf Session Agents

- "Adding a Session Agent" on page 226
- "Archive Session Agent" on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Canister Session Agent" on page 236
- "Cookie Parser Session Agent" on page 238
- "Data Drop Session Agent" on page 241
- "Data Parser Session Agent" on page 246
- "Decouple Session Agent" on page 250
- "Extended Decoupler Session Agent" on page 252
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- "Health-Based Routing (HBR) Session Agent" on page 263
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- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Tealeaf Reference Session Agent - Legacy Mode" on page 357
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• “URL Decode Session Agent” on page 382

JSON Mobile Parser Session Agent

Note: In Release 8.5, Tealeaf introduced step-based eventing, in which all client-based frameworks submit event information in a consistent JSON format. As a result, this session agent is no longer used with the latest version of the client-side capture frameworks.

- For Release 8.7, an upgrade of any Tealeaf client frameworks in use may be required.
- For more information on the new implementation of capture from logging frameworks, see "Step-Based Eventing" in the *IBM Tealeaf Event Manager Manual*.

The JSON Mobile Parser session agent parses plain-text JSON messages, which are generated by the Tealeaf iOS or Android Mobile Logging Frameworks. When the data is decoded, the session agent parses it for environment and event data, which are added as name/value pairs on the resulting hits.

- The parser does not evaluate mobile web hits, which may be captured by one of the supported client frameworks.

Note: The Tealeaf iOS and Android Mobile Logging Frameworks are a component of the IBM Tealeaf CX Mobile license for Mobile App. please contact your IBM Tealeaf representative.

Note: This session agent supports data from iOS and Android devices only.

Uses

This session agent is used by the client frameworks to generate hit data in sessions based on submitted JSON messages, which is the legacy method. These versions were introduced in Release 8.4 and have been superseded by the step-based method of messaging.

Note: This session agent applies only to the legacy, hit-splitting method of managing JSON messages from the client frameworks. If you have implemented step-based eventing, introduced in Release 8.5, then this session is not needed in your implementation.

Overview

The Tealeaf iOS/Android Mobile Logging Frameworks capture environment and event data from iOS-based or Android-based mobile applications and submits them to the Tealeaf servers for capture and processing. When the PCA has been properly configured to process these hits, they are forwarded to the Windows pipeline for decoding and analysis, the bulk of which is performed by this session agent.

As each hit is received by the session agent, it is scanned for name/value pairs that identify it as containing data from one of the supported Logging Frameworks.

- Any hits that do not contain the appropriate values are passed to the next session agent without changes.
- When the session agent encounters an error during processing of a hit, such as being caused by invalid logging data, the session agent produces a dump file, and the Windows pipeline restarts.

- For more information on the required name/value pairs, see “Request Identifiers.”

For hits that contain data submitted from a framework, the hit is parsed as described in the following steps.

- JSON messages are split into multiple Tealeaf hits to make mobile native application data accessible for eventing. The majority of the request data is cloned from the original hit.
- Each hit may contain only unique JSON message types.
  - A new hit is created if a message type is repeated.

    Note: Hits may also split per session. Tealeaf Logging Frameworks can send data from multiple sessions in a single message.
- The data is parsed into a C++ object representing the JSON message.
  - If this step fails, an error is logged. The session agent produces a dump file, and the Windows pipeline restarts.
- These additional sections are added to the request: `AppEnv and MobileEvents`, containing environment and event data, respectively.
- After each Tealeaf hit is created, it is passed to the next session agent in the pipeline for downstream processing.
- These steps are repeated for subsequent hits passing through the session agent.

Each packet submitted from the Logging Frameworks may be broken up within the Tealeaf system into multiple hits composed of different views or screens from the mobile native application.

- Tealeaf recommends using the DecoupleEx session agent after this one to throttle delivery of hits to subsequent session agents and pipelines. See “Mobile Parser Processing Pipeline” on page 277.

  Note: It may be difficult to predict how much data is generated based upon the capture of a mobile application using the Mobile Logging Frameworks. Tealeaf recommends extensive load testing in a development environment prior to deployment in production.

Prerequisites

Install Tealeaf Target page

The mobile application that is being monitored must be configured to submit requests to a Tealeaf Target page, which acknowledges receipt of the submission to enable capture and forwarding of client-side events to Tealeaf. See "UI Capture for AJAX Installation and Implementation" in the *IBM Tealeaf UI Capture for AJAX Guide*.

Note: IBM Tealeaf CX UI Capture for AJAX is only available to legacy users. New users must use IBM Tealeaf CX UI Capture j2.

Request Identifiers

Hits that are generated and submitted by the Mobile Logging Frameworks must have the following name/value pairs in the request:

```
HTTP_CONTENT_TYPE=<AnyContentTypeEndingwith>/json
HTTP_X_TEALEAF =DEVICE
X-Tealeaf-JSON-Version=N.N.N.N
```

where:

- `DEVICE` is set to `Android` or `iOS`
- `NNNN` is the JSON schema version

As each hit is received for processing, the session agent searches for the `HTTP_CONTENT_TYPE` value.

- If the type is not ending with `json`, the hit is passed downstream unchanged.
- The device string from `HTTP_X_TEALEAF=DEVICE` is parsed and checked if DEVICE matches `Android` or `iOS`. If not, the hit is passed downstream unchanged.

PCA Configuration

The PCA must be configured to capture the data type submitted from the Mobile Logging Frameworks. In the Pipeline tab of the PCA Web Console, you must specify the following:

- Any mobile pages submitted for capture should not appear in the Excluded File Extensions list.
- The TealeafTarget page must be enabled for capture.
- Any special extensions related to your mobile application need to be included in the Included File Extensions list.
- The following JSON POST types must be enabled for capture. These content types must be verified or inserted in the Capture All Post Types configuration.
  - `text/json`
  - `text/x-json`
  - `application/json`
  - `application/x-json`
  - See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

Mobile Parser Processing Pipeline

The JSON Mobile Parser session agent can be deployed in any Tealeaf pipeline, including child pipelines. Please observe the following considerations:

Note: This session agent should be deployed before any Privacy session agent in the pipeline.

- See “Privacy Session Agent” on page 291.
- See “Extended Privacy Session Agent” on page 261.

Note: To sessionize hits from the mobile application, you must insert the Sessioning session agent after this one, so that it can use the extracted `SessionID` identifier from the `MobileEnv` section as the sessioning key. See “Sessioning Session Agent” on page 332.

Pipelines are configured in the Pipeline Editor in the Tealeaf Management System.

- See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
- See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Mobile-Related Session Agents

The following session agents apply to the effective capture of application data submitted from the Logging Frameworks deployed to mobile devices.

Table 21. Mobile Parser Processing Pipeline

Suggested Order	Session Agent	Required for Framework	Description
1	JSON Mobile Parser	Y	Captures JSON-based events submitted by the deployed Tealeaf Logging Framework. For more information, see JSON Mobile Parser Session Agent.
2	Structured Data Mobile Parser	N	Captures customer data submitted in JSON posts by the mobile application. This session agent is needed in your mobile data pipeline only if you are capturing customer data from the mobile native application.
3	Decoupler	N	The JSON Mobile Parser session agent may generate multiple hits for each hit passing through the pipeline. To manage the sudden increase in traffic downstream, you may should consider inserting the Decoupler session agent downstream of the Mobile Parser. For more information, see "Decouple Session Agent" on page 250.
4	Privacy	N	After the JSON session agents, you should deploy the Privacy session agent, so that you can remove sensitive data that has been exposed in clear-text JSON messages by the parser. For more information, see "Privacy Session Agent" on page 291.
5	Sessioning	N	Generates the sessionization key for sessions originating from the mobile application using the Logging Framework. For more information, see "Sessioning Session Agent" on page 332. This session agent must be placed after the JSON Mobile Parser session agent in the pipeline, as it uses the `AppEnv` key SessionID for sessionization.

Note: If it is present, remove the Mobile Parser session agent, as it has been deprecated and replaced by the JSON version.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226. For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

```
[MobileJsonParser]
TypeName=MobileJsonParser
DLL=SessionAgentMobileJsonParser.dll
DownStreamConfigSection=TLTRef
LogLevel=Debug
EnableLogFile=true
LogKeepDays=30
OutputStats=true
StatsReportingInterval=60
```

Table 22. Configuration Settings

Display Name	Name	Description
`Log Level`	`LogLevel`	The Log level for the session agent can be one of the following numeric values. • `0` - Errors only • `1` - Warnings • `2` - Info • `3` - Performance • `4` - Parsing debugging • `5` - Function tracing Commenting out the setting disables logging. See “Logging” on page 280.
`Enable Log File`	`EnableLogFile`	When set to `true`, a log file for the session agent is written to the `Logs` directory. See “Logging” on page 280.
`Log Keep Days`	`LogKeepDays`	Set the number of days of logging files to retain. The default value is `30`.
`Output Stats`	`OutputStats`	When set to `true`, statistical information is generated from the session agent at the interval defined below.
`Stats Reporting Interval`	`StatsReportingInterval`	The interval in minutes at which statistics are generated and reported by the session agent. The default is `60` (one hour).

Logging

A log for this session agent is maintained in the Logs directory inside the Tealeaf install directory.

Unhandled exceptions

If an exception is not handled, a message similar to the following is recorded in the Windows Application Event Log.

```
Process dump file written to:
C:\Tealeaf\Logs\TeaLeafCaptureSocket.exe-(vX.X.X.XXXX)-YYYYMMDD-NNNNNN-NNNNN-
NNNNN.dmp

Please send this file along with the information below to Tealeaf customer
support, and delete the dump file when finished.

Exception <exception name and number> at address 0xADDR!
<source file name and line number>
Module: c:\tealeaf\SessionAgentMobileJsonParser.dll  BaseAddr: 0xADDR
```

The dump file referenced in the above is written into the Logs directory.

Note: In the event of an unhandled exception, the pipeline terminates and restarts, and any hits in the middle of processing are lost.

Mobile Name/Value Pairs Reference

Note: The following reference information applies to Tealeaf solutions that are using the JSON Mobile Parser session agent and are not using step-based eventing.

- This parser is not available for Release 8.3. and earlier.
- Beginning in Release 8.5, Tealeaf introduces a generic JSON messaging format in the client frameworks, which does not require this session agent. See "Tealeaf JSON Object Schema Reference" in the *IBM Tealeaf Client Framework Data Integration Guide*.
- Using the JSON-based message format, you can create events within Tealeaf. See "Step-Based Eventing" in the *IBM Tealeaf Event Manager Manual*.

Example Request Data

AppEnv section example

This section is generated only if the corresponding data is present in the submitted JSON message. This section may appear in each request of the session.

```
[AppEnv]
SessionID=9fb657a4a241d140d1e8c5c551c13752
SessionStartTime=1324065248277
```

For more information on these fields, see “AppEnv section” on page 281.

MobileEvents section example

This section is generated only if the corresponding data is present in the submitted JSON message.

```
[MobileEvents]
CustomEvent_TimeOffset=60099007
CustomEvent_ScreenViewOffset=60099007
CustomEvent_CustomEventName=AlertDialog is Pressed
```

```
CustomEvent_CustomEventData=AlertDialog Button Pressed: OK
Control_TimeOffset=60101427
Control_ScreenViewOffset=60105000
Control_Id=-1
Control_Target.Type=LinearLayout
Control_Target.SubType=ViewGroup
Control_Location.x=0
Control_Location.y=118
Control_Location.width=480
Control_Location.height=117
Control_Event.Type=Click
Control_Event.SubType=
```

For more information on these fields, see "MobileEvents section" on page 283.

RequestBody

For replay purposes, the first hit of each session contains the [RequestBody] section, which is the JSON data.

AppEnv section

The [AppEnv] section of the request contains information about the mobile application and the device on which it's running.

Name/Value Pair
Description

SessionID=x
x is the model of the device in use (e.g. iPhone)

SessionStartTime=n
n is the starting time for the session in microseconds since January 1, 1970 GMT

ClientEnvironment Message

Description: Contains device-specific information. Appears at specific intervals in a session.

ClientEnvironment

If available, the Environment name/value pairs are appended to [AppEnv] section.

- This data is repeated in any hits that are split and generated by the session agent.

Description: Contains base client environment data consistent across all devices.
Name Prefix: ClientEnvironment

Name/Value Pair
Description

ClientEnvironment_OSVersion=x
x is the Device Operating System Version.

ClientEnvironment_Width=n
n is the width of the screen.

ClientEnvironment_Height=n
n is the height of the screen.

MobileEnvironment

Name Prefix: ClientEnvironment.MobileEnvironment
Description: Contains information about mobile specific environment.

Name/Value Pair
Description

ClientEnvironment_MobileEnvironment_TotalStorage=n
n is the amount of storage capacity (in bytes) on the device.

ClientEnvironment_MobileEnvironment_TotalMemory=n
n is the amount of memory (in bytes) on the device.

ClientEnvironment_MobileEnvironment_Locale=x
x is the current locale identifier (e.g. en_US).

ClientEnvironment_MobileEnvironment_Language=x
x is the current language identifier (e.g. en).

ClientEnvironment_MobileEnvironment_Manufacturer=x
x is the manufacturer of the device.

ClientEnvironment_MobileEnvironment_DeviceModel=x
x is the model of the device in use (e.g. iPhone).

ClientEnvironment_MobileEnvironment_AppName=x
x is the name of the application being logged.

ClientEnvironment_MobileEnvironment_AppVersion=n.n
Version of the mobile application

ClientEnvironment_MobileEnvironment_UserID=x
x is a hashed user ID for the user of the device.

ClientEnvironment_MobileEnvironment_OrientationType=x
x default orientation type for the device.

Android Environment

Name Prefix: ClientEnvironment.MobileEnvironment.Android
Description: Contains information about Android-specific environment.

Name/Value Pair
Description

ClientEnvironment_MobileEnvironment_Android_KeyBoardType=x
String Values:

- QWERTY
- NO_KEYS

ClientEnvironment_MobileEnvironment_Android_Brand=x
x is the Brand of device

ClientEnvironment_MobileEnvironment_Android_FingerPrint=x
x is the finger print of the device

Example

```
ClientEnvironment_OSVersion=2.3.4
ClientEnvironment_Width=0
ClientEnvironment_Height=0
ClientEnvironment_MobileEnvironment_TotalStorage=89245748
ClientEnvironment_MobileEnvironment_TotalMemory=3151234
ClientEnvironment_MobileEnvironment_Locale=English (United States)
ClientEnvironment_MobileEnvironment_Language=English
```

```
ClientEnvironment_MobileEnvironment_Manufacturer=motorola
ClientEnvironment_MobileEnvironment_DeviceModel=MB860
ClientEnvironment_MobileEnvironment_AppName=
ClientEnvironment_MobileEnvironment_AppVersion=1.0
ClientEnvironment_MobileEnvironment_UserID=fpgh48
ClientEnvironment_MobileEnvironment_OrientationType=PORTRAIT
ClientEnvironment_MobileEnvironment_Android_Brand=MOTO
ClientEnvironment_MobileEnvironment_Android_FingerPrint=
   MOTO/olyatt/olympus:2.3.4/4.5.91/110625:user/release-keys
ClientEnvironment_MobileEnvironment_Android_KeyBoardType=1
```

MobileEvents section

MobileEvents Name/Value Pair Naming Conventions

The entries in the [MobileEvents] section of the request are named after the message type on which they are reporting. Each name/value pair represents a data member from a JSON object, so the name is constructed to represent the hierarchy, but in a form that is usable for Tealeaf processing.

Every event has at least one entry:

Name/Value Pair
Description

<messageType>.TimeOffset=n
n is the timestamp offset for the event

<messageType>.ScreenViewOffset=n
n is the timestamp offset for the event since the context was loaded

The following is a list of the expected name/value pairs for each message type. If a value is not populated by the client message, it is not displayed.

Control Message

Description: Contains User Interaction specific information.
Name Prefix: Control_Target
Description: Contains information about target UI element specific to the user action.

Name/Value Pair
Description

Control_TimeOffset=n
n is the timestamp offset for the event

Control_ScreenViewOffset=n
n is the timestamp offset for the event since the context was loaded

Control_Target_Type=x
x is the type of UI control

Control_Target_SubType=x
x is the sub type of UI control if any

Control_Target_Id=x
x is the unique Id of the control

Control_Target_DwellTime=n
n is the time user spent on that UI control

Control_Target_CurrentState=x
x is the current state of UI control if any (Example: Current text in a text box)

Control_Target_PreviousState=x
x is the previous state of UI control if any (Example: Initial text in a text box before the event occurred)

Name Prefix: Control_Target_Position
Description: Contains information about target UI element's position relative to the screen.

Name/Value Pair
Description

Control_Target_Position_x=n
n is x coordinate of UI control

Control_Target_Position_y=n
n is the y coordinate UI control if any

Control_Target_Position_width=n
n is the width of UI control

Control_Target_Position_height=n
n is the height of UI control if any

Example

```
Control_TimeOffset=60101427
Control_TimeOffset=60101427
Control_Target_Type=LinearLayout
Control_Target_SubType=ViewGroup
Control_Target_Id=0
Control_Target_DwellTime=3245
Control_Target_CurrentState=
Control_Target_PreviousState=
Control_Target_Position.x=0
Control_Target_Position.y=118
Control_Target_Position.width=100
Control_Target_Position.height=75
Control_Event_Type=Click
Control_Event_SubType=
```

ScreenView Message

Description: Contains the ScreenViewView visible to the visitor.
Name Prefix: ScreenView
Description: Contains information about current ScreenView's Load or Unload operations.

Name/Value Pair
Description

ScreenView_TimeOffset=n
n is the timestamp offset for the event

ScreenView_ScreenViewOffset=n
n is the timestamp offset for the event since the context was loaded

ScreenView_LogicalPageName=x
x is the name of the context

ScreenView_Type=x
x is either LOAD or UNLOAD.

ScreenView_RenderTime=n
n is the time taken in milliseconds to render the context upon LOAD.

ScreenView_Referrer=x
x is the reference to the previous context that initiated the current context.

Example

```
ScreenView_TimeOffset=225
ScreenView_ScreenViewOffset=0
ScreenView_LogicalPageName=Tab2
ScreenView_Type=LOAD
ScreenView_RenderTime=22
ScreenView_Referrer=Tab1
```

Custom Event Message

Name Prefix: CustomEvent
Description: Contains custom event name and event data.

Name/Value Pair
Description

CustomEvent_CustomEventName=x
x is the name of custom event

CustomEvent_CustomEventData=x
x is the custom data from the event

Example

```
CustomEvent_TimeOffset=60099007
CustomEvent_ScreenViewOffset=0
CustomEvent_CustomEventName=AlertDialog
CustomEvent_CustomEventData= AlertDialog Button Pressed: OK
```

Client State Message

Name Prefix: ClientState.MobileState
Description: Contains mobile device state data which changes over time.

Name/Value Pair
Description

ClientState_MobileState_IPAddress=x
x is the name of custom event

- This value is 0.0.0.0 if the device is connected to a wireless WAN.

ClientState_MobileState_Battery=n
n is the battery level of the device

ClientState_MobileState_FreeMemory=n
n is the free memory available in Bytes

ClientState_MobileState_FreeStorage=n
n is the free storage available in Bytes

ClientState_MobileState_Orientation=n
n = 0, 90, 180,-180,-90

ClientState_MobileState_Carrier=x
x is the name of carrier to which the device is connected

ClientState_MobileState_NetworkReachability=x
x is the type of network the to which the device is connected. Examples: ReachableViaWIFI, 3G, Edge

ClientState_MobileState_KeyboardState=x
x is Keyboard State HIDDEN_TRUE or HIDDEN_FALSE

Example

```
ClientState_TimeOffset=0
ClientState_ScreenViewOffset=0
ClientState_MobileState_IPAddress=92.68.34.114
ClientState_MobileState_freeMemory=228896768
ClientState_MobileState_FreeStorage=2147483647
ClientState_MobileState_Orientation=0
ClientState_MobileState_Carrier=Verizon
ClientState_MobileState_NetworkReachability=ReachableViaWiFi
```

Exception Message

Name Prefix: ClientException
Description: Exception logs are shown as follows.

Name/Value Pair
Description

ClientException_Name=x
x is the name of exception

ClientException_Description=x
x is the description of the exception

ClientException_Description_Exists=True
Description may have a carriage return. This can be used as a End Tag sentinel when making a hit attribute.

ClientException_StackTrace=x
x is the stack trace left by the exception handler.

ClientException_StackTrace_Exists=True
Stack trace may have carriage return. This can be used as End Tag sentinel when making a hit attribute.

Example

```
ClientException_Name=CrashTest
ClientException_Description=-[TProtoMonitoringLevelViewController crashme]:
unrecognized  selector sent to instance 0x6656060
ClientException_Description_Exists=True
ClientException_StackTrace=-[TProtoMonitoringLevelViewController crashme]:
ClientException_StackTrace_Exists=True
```

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- “Archive Session Agent” on page 227
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- “Canister Session Agent” on page 236
- “Cookie Parser Session Agent” on page 238
- “Data Drop Session Agent” on page 241
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- “Extended Privacy Session Agent” on page 261
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- JSON Mobile Parser Session Agent
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- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
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- “URL Decode Session Agent” on page 382

Managed Code Session Agent

The Managed Code session agent (SessionAgentCLR) is a development framework that enables custom functionality to be built on top of the pipeline using an object-oriented development language, such as C# or VB.NET. For example, Managed Code can be used to conduct external data lookups, develop custom data filters and transformations, or invoke external actions.

Managed Code allows access to the following external resources:

- Microsoft .NET class library
- COM objects
- External DLLs

Note: SessionAgentCLR requires version 1.1 or higher of Microsoft's .NET Framework. MS Visual Studio.NET 2003 or later is recommended for writing and debugging.

SessionAgentCLR uses the following procedure:

- Loads an instance of the Common Language Runtime.
- Compares source file(s) to the assembly `.DLL`. May be compiled if `.DLL` is missing or source is newer.
- Loads user assembly. Init method is called. The user code can do any needed global initialization here.
- Calls the ProcessHit method for each hit. The user code can modify or drop hit, or add new hit(s).
- Calls the Heartbeat method on each maintenance scan. Time-specific code can execute at this time.

- Calls the Cleanup method on pipeline teardown. The user code can perform global cleanup at this time.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings_c

The following configuration options are available:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 23. Managed Code Session Agent

Display Name	Name	Description
`Assembly DLL`	`AssemblyDLL`	The name of the `.DLL` containing the session agent assembly (compiled session agent). This setting is also used to specify the output `.DLL` name if the CompileIfNeeded is set to `True`.
`Assembly Name`	`AssemblyName`	Specifies the name of the assembly. Typically, it is the same value as AssemblyDLL, without the `.DLL`.
`Class Name`	`ClassName`	The name of the class that implements the IHitHandler interface for the session agent.
`Compile If Needed`	`CompileIfNeeded`	When set to `True`, the timestamps for all specified source files are compared with the timestamp for the assembly `.DLL`. If any source files have been modified or if the assembly `.DLL` doesn't yet exist, then the assembly for the session agent is compiled. This option should be set to `False` if the source file is not available on the server running this session agent.
`Debug`	`Debug`	Specifies whether to build the session agent assembly in debug mode, if `CompileIfNeeded=True`.

Table 23. Managed Code Session Agent (continued)

Display Name	Name	Description
Assembly Base Path	AssemblyBase	This setting is used to specify the directory, relative to the Tealeaf install directory, to use as the base directory for searching for assembly DLLs that are not in the Global Access Cache (GAC).
Log File	LogFile	Specifies the name and optional path, relative to the Tealeaf install directory, of a log file for the managed code session agent. Any trace methods called in the session agent code write to the specified log file, if appropriate for specified LogLevel.
Log Level	LogLevel	The level of verbosity used when writing to the log file. Possible values are `error`, `warn`, `info`, `debug` or `off`. The default value is `warn`.
Include Response	IncludeResponse	Specifies whether to pass the response to the hit handler in the session agent. If the response is not examined or modified by the session agent, then this value should be set to `False` to improve performance.

Example Configuration

```
[Managed]
TypeName=Managed
DLL=SessionAgentCLR.dll
SourceFile=managed\source\testhandler.cs
AssemblyDLL=TestHandler.dll
AssemblyName=TestHandler
ClassName=TestHandler.TestClass
References=System.Data.dll, System.XML.dll
CompileIfNeeded=True
Debug=True
AssemblyBase=managed
HitObjectDLL=Tealeaf.Pipeline.dll
LogFile=managed\saclr.log
LogLevel=warn
DownStreamConfigSection=Null
# Add any additional config options here. They will be available to your code
# via the Tealeaf object.
```

Tealeaf Session Agents

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Null Session Agent

The Null session agent terminates the capture pipeline if no action on the data is necessary. This session agent is useful if there is no further need for the data.

Note: The Null session agent is a terminating session agent, so the `-DownStreamConfigSection` option is not required.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Tealeaf Session Agents

- “Adding a Session Agent” on page 226
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Privacy Session Agent

The Privacy session agent provides a rule-based means of blocking, encrypting or replacing sensitive data in captured Web requests and responses. The Privacy session agent can be deployed on the IBM Tealeaf CX server, a IBM Tealeaf CX Passive Capture Application server, or individual Web servers.

Note: For some deployments of the Processing Server, this session agent is included in the default pipeline and is required. See “CX Pipeline Configuration” on page 214.

The Privacy session agent can block, encrypt, or replace sensitive data, drop hits (or just response data from hits), as well as add, modify, or remove name/value pairs in the request.

- **Blocked Data:** Blocked data is permanently replaced with a specified strike character, which is repeated to match the length of the blocked data.
  - The default strike character is `X`.

    Note: This replacement is a non-reversible operation. Tealeaf recommends only blocking sensitive data that never needs to be retrieved in the future.
- **Encryption:** Encryption is performed using a privacy key, which is assigned to a specific NT group. Each privacy action can specify a key or group for encryption. After the data is encrypted, the original data is blocked using a different strike character to indicate that it has been encrypted. The encrypted data is saved in the `[Privacy]` section in the request.
  - The default strike character for encryption is `@`.

– You can assign privacy keys using TMS.
– When a session with data encrypted by Privacy session agent is replayed, the IBM Tealeaf CX RealiTea Viewer or Browser Based Replay retrieves the privacy keys for groups to which the current user belongs and decrypts only those data items encrypted with the authorized keys.

  Note: Fields that have been encrypted using privacy rules in the IBM Tealeaf CX Passive Capture Application or Windows pipelines cannot be decrypted in the Portal.

  - These encrypted fields can be decrypted **only** during replay.
  - As an alternative, you can leave the configured fields in unencrypted state in the session data and then define privacy rules specifically to be applied during session replay, permitting the display of the unencrypted data in the Portal, as needed. See “On-Demand Privacy” on page 133.

- **Replace Data:** When data is replaced, a pre-configured replacement string is inserted, or the data is removed, if no replacement string is specified. This operation is non-reversible.
- **Edit name/value pairs:** You can also use the Privacy session agent to add, modify or remove name/value pairs (a field name and its value) in the request. This feature provides powerful options for manipulating the metadata used to process hits.

Privacy session agent versions

Tealeaf currently supports two Privacy session agent session agents: `[Privacy]` and `[PrivacyEx]`. The latter extends the functionality of the former.

Note: `[Privacy]` is an earlier version with a reduced feature set. When you enable Privacy session agent in your pipeline, you should use `[PrivacyEx]`.

The remainder of this section covers the `[Privacy]`, including the Privacy Editor, the TMS utility through which you configure your privacy rules.

- See “Accessing the Privacy Editor” on page 294.

Support for Mobile App

Note: Use of the Privacy or Extended Privacy session agent to block or mask step-based JSON data submitted for capture from a Tealeaf client framework is not supported in this release. To enable privacy, you must use the privacy solution provided by the client framework. See "Data Privacy in Tealeaf Client Frameworks" in the *IBM Tealeaf Client Framework Data Integration Guide*.

Adding and Configuring the Session Agent

Testing Privacy

Before you apply your privacy rules into the pipeline, you can test them using the Tealeaf Privacy Tester utility. This utility should be a standard part of your privacy workflow. See “Privacy Tester Utility” on page 390.

Testing Privacy in RTV

The IBM Tealeaf CX RealiTea Viewer includes an integrated Privacy Tester.

Note: When using data from RTV for testing your privacy rules, additional configuration in RTV may be required. See "RealiTea Viewer - Privacy Tester" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Before You Begin

Before you enable the Privacy session agent, you should define its tests, rules, and actions through the `Transport Service\Privacy session agent configuration` node in TMS. See “Accessing the Privacy Editor” on page 294.

Adding the Session Agent

Session agents can be added through the Pipeline Editor. See “Adding a Session Agent” on page 226.

Enabling the Privacy Session Agent

After you have developed and tested the rules, tests, and actions in your Privacy session agent, you can enable it through the `Transport Service\Transport Service configuration` node. See “Accessing the Privacy Editor” on page 294.

- After you have configured your Privacy session agent, it appears in the Pipeline Status tab of TMS. See "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
- You may need to schedule or execute an update to push the Privacy session agent configuration to TMS slave servers. See "TMS Jobs Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
- For more information on the Pipeline Editor, see "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Basic Steps

The following steps provide a basic outline of how to enable the Privacy session agent to your pipeline configuration. Each of the following steps references a section for additional detail.

1. To enable encryption, edit the `Search Server\Search Server configuration` using TMS to define privacy keys for groups that have access to encrypted data. See “Configuring the Search Server” on page 107.
2. Create rules and actions in the `Transport Service\Privacy session agent configuration` in TMS to perform the blocking and encryption actions desired. See “Accessing the Privacy Editor” on page 294.
3. Add the Privacy session agent configuration section (`[Privacy]`) to the pipeline configuration. See “Enabling Privacy through TMS” on page 317.
4. Specify this session agent as the DownStreamConfigSection for one of the session agents currently in the pipeline.
5. Change the DownStreamConfigSection value for the `[Privacy]` section to reference the session agent to which the previous session agent was originally pointing.
6. Verify that the Privacy session agent configuration file (`Privacy.cfg`) is properly configured before restarting the pipeline.

7. Restart the pipeline. Typically, restarting require a restart of the appropriate service, such as the Tealeaf Transport Service. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
8. When the restart is complete, check the application event log for errors.
   - Any errors in the Privacy session agent configuration are logged as errors in the application event log.
   - In most cases where errors have occurred, the pipeline still successfully loads and processes hits, but any rules or actions with an invalid configuration are ignored.

Accessing the Privacy Editor

Through the Privacy Editor in TMS, you can configure the Privacy filter, which applies a set of user-defined rules, tests, and actions to the pipeline traffic through the Privacy or Extended Privacy session agent. For more information on TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

To access the Privacy Editor:

1. Login to the Portal as a Tealeaf administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**.
3. Drill-down on the Transport Service node for the server you wish to configure.
4. Click **Privacy Filter configuration**.
5. In the Config Actions panel, click **View/Edit**.
6. The Privacy Editor is displayed, showing the current set of privacy rules.

The Privacy Editor is divided into four sections:

- "Rules" are used to determined which hits to select for data blocking, encryption or other Privacy action.
- "Tests" on page 298 are comparisons used to determine whether an associated action should be taken upon evaluation.
- "Actions" on page 300 indicate the data in the hit to process and how to process it.
- "Keys" on page 308 determine the privacy keys to utilize for encryption processes.

The data in the Privacy Editor is available in `Privacy.cfg`.

Rules

Privacy **rules** are the mechanism by which hits are selected for data blocking or encryption. The Privacy session agent interprets each rule against the hit data and filters out content based on the rule specification. Rules are mechanisms for grouping actions to fire based on the same condition. See "Actions" on page 300.

Note: When creating privacy rules that modify content on UpdatePanel pages, the byte count for the unmodified page must be maintained in the modified page after the modification has been applied. Otherwise, these pages do not replay correctly. This limitation also applies to replay rules. See "RealiTea Viewer - Replay Rules" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Rule naming conventions

In the Rules configuration panel, each rule is defined in its own section. Rule sections are named starting with `[Rule1]`. The next rule is `[Rule2]`, which is followed by `[Rule3]`, and so on.

- Rules **must** be named with the `Rule + Number` format shown above or the Privacy session agent does recognize them.
- Rules are evaluated in numeric order, not in the order listed in the file. For example, if `[Rule2]` is listed before `[Rule1]`, `[Rule1]` is still evaluated first.
- A maximum of 256 rules are supported by the Privacy session agent.

Rule tests

Each rule can have one or more tests, which are evaluated to determine whether to process the actions associated with the rule.

- For a single condition to evaluate, you can define an embedded test in the `[Tests]` section using the ReqField, ReqOp and ReqVal configuration options. See "Tests" on page 298.
- To create multiple tests or to share a test among several rules, you can create named tests and specify them in the order to be evaluated by using the Tests configuration option.
- For examples of rule formats including tests and actions, consult the `Privacy.cfg` file in the Tealeaf install directory.

  Note: To perform any blocking or encryption, there must be at least one defined rule. You can create a rule to process all hits by omitting the Tests configuration option and any embedded test configuration options. See "Tests" on page 298.

Manipulating rules

- To add a rule, click **Add Rule**. See "Configuring rules" on page 296.
- To edit a rule, click **Edit** next to the listed rule. See "Configuring rules" on page 296.
- To change the order of rules listed in the Privacy session agent configuration, click the up and down arrows.
- To delete a rule, click **Delete** next to the listed rule.

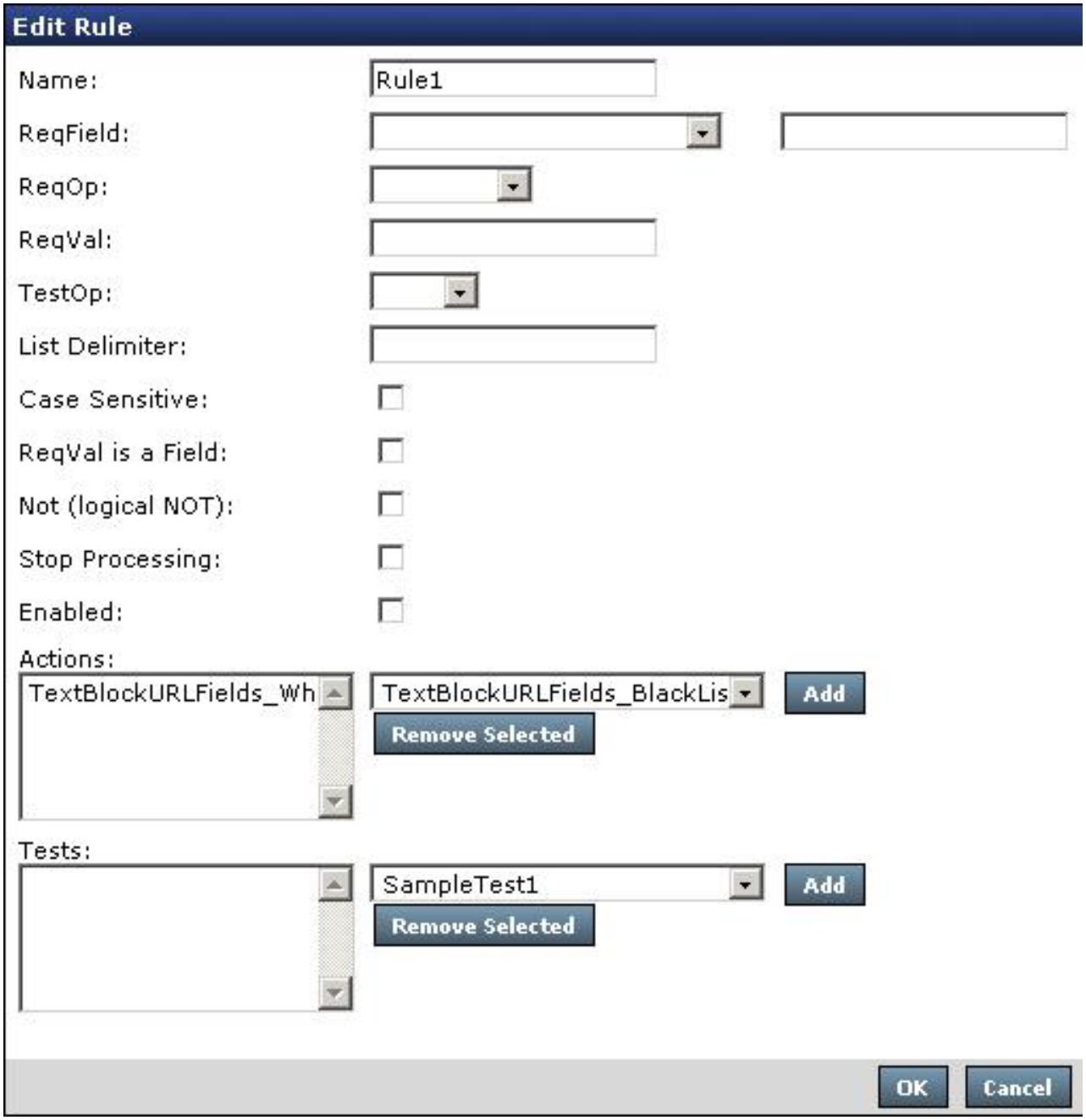

Figure 30. Configuring rules

The configuration options for rules are as follows:

Option Description

Name Enter a name for the rule. Rule names must be in the form of `Rule + Sequential Number`. See "Rule naming conventions" on page 295.

ReqField
This option specifies the name of a field, the name portion of a name/value pair, in the request file. The value of this field is used for comparison. You may also apply one of following special field names:

- TL_URLEXT - The file extension portion of the URL
- TL_URLTAIL - The tail of the URL, which includes the last / in the URL and everything following it
- TL_VIRTUALDIR - The virtual directory portion of the URL

ReqOp ReqOp defines the comparison operation performed by this rule between ReqField and ReqVal. The valid values for this option are the following:

- = - True if the field value equals ReqVal. String comparison is case-insensitive
- != - True if the field value does not equal ReqVal. String comparison is case-insensitive
- > - True if the field value is greater than ReqVal
- < - True if the field value is less than ReqVal
- contains - True if ReqVal is contained in the field value
- partof - True if the field value is part of (contained in) ReqVal
- partoflist - True if the field value matches one of the values in ReqVal.
  - The list of values in ReqVal can be delimited by semicolons or other delimiter specified by the ListDelimiter property.
- exists - True if the request field exists. The ReqVal portion of the rule is not required.
  - For an example rule using the exists operator, see "Example - Existence of a request field means deleting a request section" on page 316.
- null - True if the request field exists yet has no value. The ReqVal portion of the rule is not required.
- notnull - True if the request field exists yet has a value. No validation is performed on the value. The ReqVal portion of the rule is not required.

ReqVal

ReqVal specifies the value with which to compare the value of the field specified by ReqField. This value can either be a literal value or a field name.

- If a field name is specified, then the value of the field is used for the comparison.
- To use a field name, you must specify ReqVal Is a Field=true for the rule.

TestOp

Logical operator to use when multiple tests are specified. Possible values are AND and OR. When TestOp=AND, all tests must return true for the actions to be processed. If TestOp=OR the actions are processed if any of the tests return true. If no value is specified, AND is applied as the default value.

Note: You may apply only one test operator to a single rule. If you require combinations of AND and OR operators, they must be broken out into multiple rules.

List Delimiter

The character used to separate list items in ReqVal when using the PARTOFLIST ReqOp. The default is a semicolon (;).

Case Sensitive
`true` or `false` value indicating whether the searches for field names should be case-sensitive. Default is `false`. Setting this to `true` accelerates searches.

ReqVal Is a Field
`true` or `false` indicating whether ReqVal contains a field name.

Not `true` or `false` value - if `true` then the result of the test evaluation is inverted (logical NOT). See "Notes on NOT operator."

Stop Processing
`true` or `false` value indicating whether to stop processing further rules if this rule evaluates to `true`.

Enabled
`true` or `false` Value which specifies whether or not this rule is active.

Actions
One or more action names which correspond to the names of action sections to process if this rule returns `true`.

- To add an action, select the action from the drop-down. Then, click **Add**.
- To remove an action from the list, select it and click **Remove Selected**.
- See "Actions" on page 300.

Tests One or more test names which correspond to the names of test sections. The specified tests are evaluated to determine whether the action(s) are executed for the rule. If no test is specified, then the actions are executed for every hit.

- To add a test, select the test from the drop-down. Then, click **Add**.
- To remove a test from the list, select it and click **Remove Selected**.
- See "Tests."

Notes on NOT operator

Tests using the `Not` operator return `true`, when the field is not found for all operators except the `exists` operator.

Note: If you are performing a `not` operator on a comparison test, you should first check to see if the field exists before performing the comparison.

Tests

Privacy **tests** are comparison conditions that are evaluated to determine whether to execute the actions for associated with a test.

- The name of a test must be unique among all section names.
- Each test can be used by any number of rules.

Manipulating tests

- To add a test, click **Add Test**. See "Configuring tests" on page 299.
- To edit a test, click **Edit** next to the listed test. See "Configuring tests" on page 299.
- To delete a test, click **Delete** next to the listed test.
  - Some tests cannot be deleted.

Configuring tests

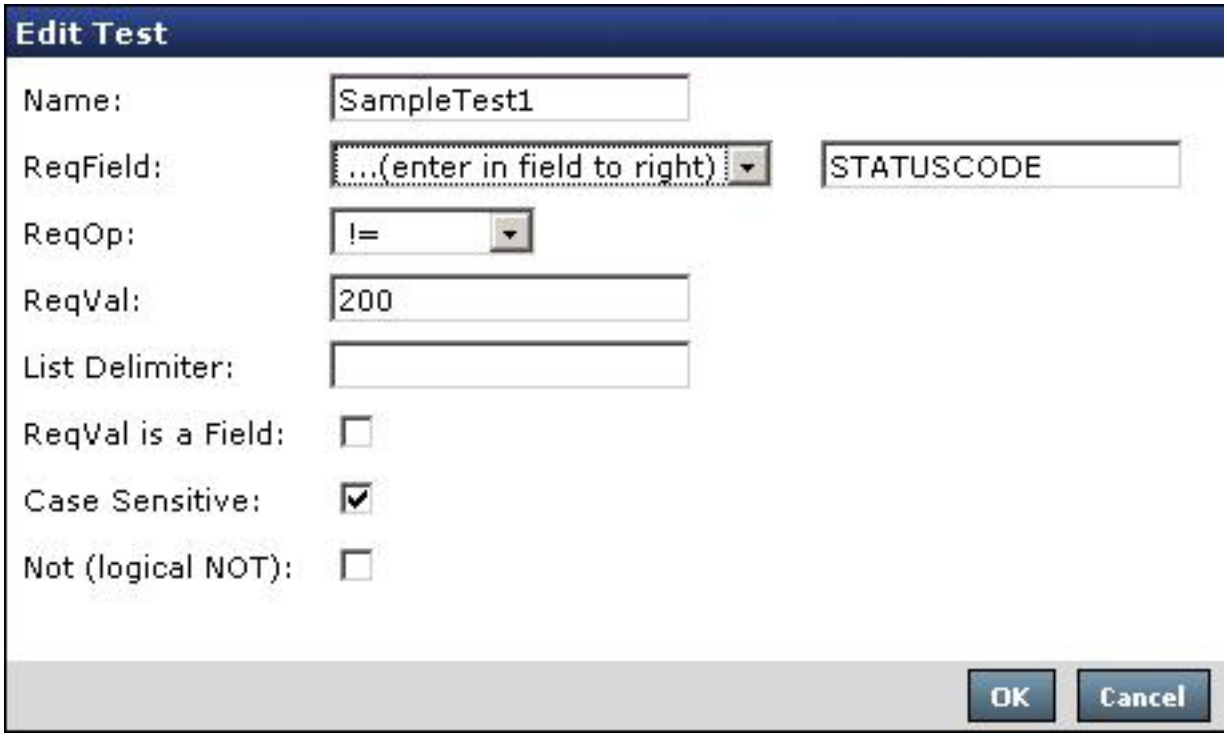

Figure 31. Configuring tests

The configuration options for Tests are the following:

Option Description

Name Enter a name for the test. This name must be unique among all tests.

ReqField
This option specifies the name of a field, the name portion of a name/value pair, in the request file. The value of this field is used for comparison. You may also apply one of following special field names:

- `TL_URLEXT` - The file extension portion of the URL
- `TL_URLTAIL` - The tail of the URL, which includes the last / in the URL and everything following it
- `TL_VIRTUALDIR` - The virtual directory portion of the URL
- To enter another field name, select `...(enter in field to right)`. Enter the name of the field in the provided textbox.

  Note: Privacy test conditions cannot reference request fields that begin with `TL_`. Fields that utilize these names are considered specific to Tealeaf.

ReqOp ReqOp defines the comparison operation performed by this rule between ReqField and ReqVal. The valid values for this option are the following:

- `=` - True if the field value equals ReqVal. String comparison is case-insensitive
- `!=` - True if the field value does not equal ReqVal. String comparison is case-insensitive
- `>` - True if the field value is greater than ReqVal

- `<` - True if the field value is less than ReqVal
- `contains` - True if ReqVal is contained in the field value
- `partof` - True if the field value is part of (contained in) ReqVal
- `partoflist` - True if the field value matches one of the values in ReqVal.
  - The list of values in ReqVal can be delimited by semicolons or other delimiter specified by the ListDelimiter property.
- `exists` - True if the request field exists.

  Note: For the `exists` operator, you must enter a ReqVal, although this value is ignored.

`ReqVal`
ReqVal specifies the value with which to compare the value of the field specified by ReqField. This value can either be a literal value or a field name.
- If a field name is specified, then the value of the field is used for the comparison.
- To use a field name, you must specify `ReqVal is a Field=true` for the rule.

`ReqVal is a Field`
If this option is set to `true`, then the value specified by ReqVal is interpreted as a field name. The default value is `false`.

`List Delimiter`
The character used to separate list items in ReqVal when using the `partoflist` ReqOp. The default value is a semicolon (`;`).

`Case Sensitive`
Boolean value indicating whether the searches for field names should be case-sensitive. Default value is `false`. Setting this to `true` accelerates searches for this data.

Actions

Privacy **actions** identify the data to process and define the type of processing to perform on it.
- Each action is defined in its own section. An action's name must be unique among all section names.
- Each action can be used by any number of rules.

Buffered actions

When privacy actions are executed, the resulting changes are buffered. `[Rule1]` is tested first, and if it evaluates to `true`, its action is buffered for later execution. `[Rule2]`, `[Rule3]`, and all subsequent rules are tested, and their actions are buffered in the order of evaluation as necessary. Each subsequent action is taken on the data before it has been changed; it does not apply changes to data made by previous actions.

There is one exception:

Note: For `ReqSet`, `ReqAppend`, and `ReqDelete` actions, which make changes to the request data, the Privacy session agent examines buffered changes made by previous `ReqSet`, `ReqAppend`, and `ReqDelete` actions, as well as the existing data. For example, if two consecutive actions set a value for the request variable `Foo` in the

[appdata] section of the request, the second action overrides the first. However, these actions cannot see any changes made by previous block or encrypt actions.

Manipulating actions

- To add an action, click **Add Action**. See "Configuring actions."
- To edit an action, click **Edit** next to the listed action. See "Configuring actions."
- To delete an action, click **Delete** next to the listed action.
  - Some actions cannot be deleted.

Configuring actions

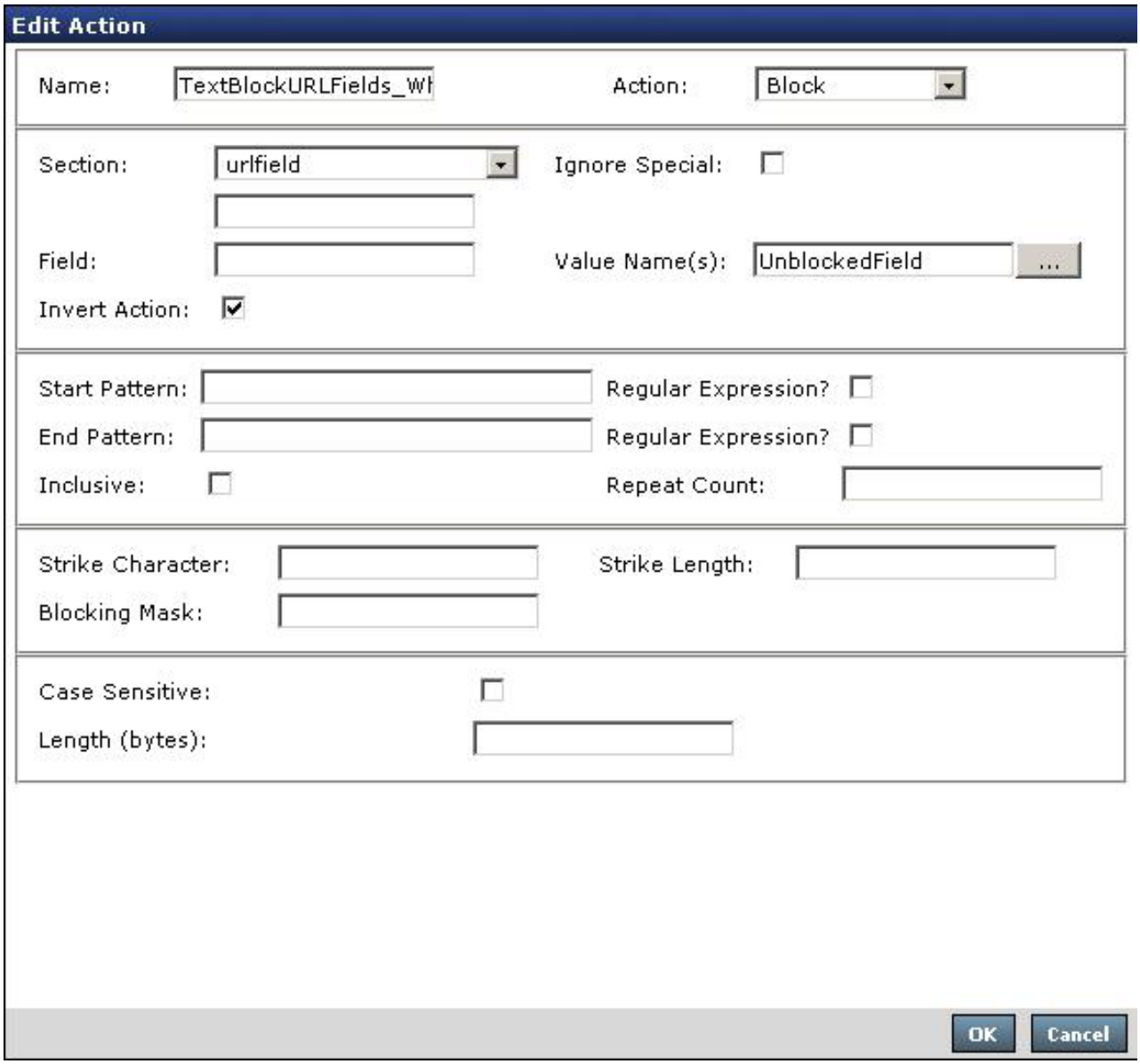

Figure 32. Configuring actions

The configuration options for actions are the following.

Name/Action section

Option Description

Name Enter a name for the action. This name must be unique among all action.

Action

Identifies the action to be performed. The available actions are available:

- Block - Blocks the matched data using the specified strike character.
- Encrypt - Encrypts the matched data and masks it with the specified strike character.
- Replace - Replaces the matched data with a specified text string.
- DropHit - Drops the current hit. No further action is taken.
- DropResponse - Drops the response from the current hit.
- ReqSet - Sets or replaces the value for the specified name/value pair in the request. Creates the name/value pair if it doesn't exist. Also creates the specified section if it doesn't exist.
  - Actions of this type are buffered. See "Buffered actions" on page 300.
- ReqAppend - Appends to the value of the specified name/value pair in the request. Creates the name/value pair if it doesn't exist. Also creates the specified section if it doesn't exist.
  - Actions of this type are buffered. See "Buffered actions" on page 300.
- ReqDelete - Removes the specified name/value pair completely from the request. This does not remove the section, even if it is empty.
  - Actions of this type are buffered. See "Buffered actions" on page 300.

Encryption Key

When Action is set to Encrypt, the Encryption Key option is used to specify the key ID of the privacy key to use for encryption. This ID should correspond to the key ID for the group whose members should be able to decrypt the data when replaying the session.

Note: To specify the encryption key, either Key or Group may be used, but not both.

- See "Configuring the Search Server" on page 107.

Group When Action is set to Encrypt, the Group option is used to specify the group name whose privacy key is used for encryption and whose members should be able to decrypt the data when replaying the session. The specified group must already have a privacy key using TMS and must be specified in the format domain\groupname. For example, a group named admin in the Windows domain operations is specified as follows:

```
Group=operations\admin
```

Note: To specify the encryption key, either Key or Group may be used, but not both.

Destination section

Option Description

Section

The Section option is used to identify the name of the section containing the data to process. It can be one of the section names in the request file (e.g., [env]) or one of the following reserved names:

- `response` - Specifies that the response should be searched for the specified data.
- `urlfield` - Performs the action for the specified Value Name(s) (or all if Value Name is omitted) for values in the urlfield section, QUERY_STRING, query string in RawRequest (if present), query string in HTTP_REFERER and the Referer request header, and request body in RawRequest (if present). The name of the urlfield field(s) to process should be specified using Value Name.
- `cookie` - Performs the action for the specified Value Name(s) (or all if Value Name is omitted) for values in the cookie section, HTTP_COOKIE and HTTP_SET_COOKIE name/value pairs, Set-Cookies headers in the ResponseHeader section (if present), Set-Cookie headers in the response, and the Cookie header in the RawRequest section (if present). The name of the cookie(s) to process should be specified using Value Name.

  Note: If a Section is not specified in an action, then the entire request buffer is used.

  Note: When editing a Section value in raw mode through TMS, do not use double-quotes (") in the Section name.

`Ignore Special`

This Boolean value indicates whether to ignore special handling when `urlfield` or `cookie` is specified for the `Section` (see above).

- When `true`, Start Pattern can be used in the `[urlfield]` and `[cookie]` sections.
- The default value is `false`.

`Field` The Field option is used to optionally specify one or more comma-separated field names. If both Field and Value Name are omitted, then the entire section (specified by the Section parameter) is blocked or encrypted.

Note: When blocking or encrypting an `[xmlN]` section of the request, you cannot use `Field` and `Value Name` combinations to specify the data, due to the different formatting in these sections. You must use `Start Pattern` and `Start Pattern RE` to specify the content to block or encrypt.

The value of Field can either be a field name (name portion of a name/value pair) or one of the following reserved names:

- `body`:
  - If `Section=response`, then the body of the response is processed, not including response headers.
  - If `Section=RawRequest` and the RawRequest section is present, then the request body is processed, if it is present.
- To include a specific header in the response, enter the name of the header for the `Field` value.

  Note: To apply privacy to response header fields, omit the colon from the field name. For example, use `x-mydatafield`, instead of `x-mydatafield:`.
- Leave `Field` value empty to include the entire header section.

`Value Name`

Value Name is used to optionally specify one or more value names.

- If Section=urlfield, then this option specifies the urlfield names to be processed.
- If Section=cookie, then this option is used to specify the cookie(s) to process.

  Note: When blocking or encrypting an [xmlN] section of the request, you cannot use Field and Value Name combinations to specify the data, due to the different formatting in these sections. You must use Start Pattern and Start Pattern RE to specify the content to block or encrypt.
- Else, Value Name specifies the name portion of a name/value pair within the value of a request field or response header (if Section=response).

Invert Action

true or false value indicating whether to invert the action. When enabled, this option performs the action on all Fields or Value Names **except** the ones specified.

- If Value Name is specified, then all except the name(s) specified in Value Name are processed.
- If Value Name is not specified then the name(s) specified for Field is/are excepted from the action.

  Note: This can only be used with Block, Encrypt and Replace actions. Start Pattern may not be used with an invert action.

Pattern Expression section

Option Description

Start Pattern

Start Pattern is used for text matching within regions of data, such as the response body, an XML block in the request, or a long value for a name/value pair. The data (specified by Section, Field and Value Name) is searched for the string specified by Start Pattern. If Start Pattern is used, then you must also specify either End Pattern or Length, unless you set Inclusive to true. When Inclusive=true, then the Start Pattern and optional End Pattern are blocked/encrypted as well. This option is useful for blocking or encrypting a constant data string. If Inclusive=false, then the Start Pattern is not processed.

End Pattern

The End Pattern option specifies the string pattern which signals the end of the data matched by a Start Pattern. All data from Start Pattern to End Pattern is processed, if Inclusive=true. If Inclusive=false, the pattern strings are not included.

Regular Expression?

If the Start Pattern or End Pattern value represents a regular expression, set this value to true.

Inclusive

The Inclusive option identifies whether to block or encrypt the Start Pattern and End Pattern (if used), along with any data processed as part of a Start Pattern search. The default value is false.

Repeat Count

For actions with a Start Pattern, this option specifies how many instances of data matching the pattern to process.

Replacement section

Option Description

Strike Character

Strike Character is used to replace the original data that is blocked or encrypted with an alphanumeric character. The following values cannot be used as Strike Character:

- . - (period)
- , - (comma)
- / - (forward slash)
- (backslash)
- [- (left square bracket)
-] - (right square bracket)
- | - (pipe)
- ' - (single quote)
- " - (double quote)

Strike Length

Strike Length is used to specify the length in bytes of the matched data to strike. This option is the number of Strike Character characters used to replace the original data (if `Action=Block` or `Action=Encrypt`). If Strike Length is longer than the original data length, then additional strike characters are added. If Strike Length is shorter than the original data length, then Strike Length characters are replaced with the Strike Character and the remaining data is removed.
If Strike Length is a negative number, then the number of characters represented by the absolute value of Strike Length is retained. For example, to leave the last four characters of a value untouched, set `Strike Length=-4`.

Blocking Mask

An optional regular expression that specifies which characters in the found data are replaced with the strike character. All characters within a group, as defined by parentheses, in the regular expression are replaced with the strike character. Characters that match part of the pattern outside of a group are not replaced. This option does not apply to Replace actions.

For example, the following mask would block the numbers in a Social Security Number, leaving the dashes visible:

```
BlockingMask=([0-9]
{3}

)-(--[0-9]-
{2}
-)-([0-9]
{4})
```

The following example leaves the first 4 digits of a credit card number visible:

```
BlockingMask=[0-9]{4}
([0-9]\*)
```

Blocking Mask is used in lieu of Strike Length. You may use one or the other, but not both.

Note: Be careful when using Blocking Mask. If the data does not match the regular expression specified for Blocking Mask then the data is not blocked or encrypted.

Replace String
The string used to replace the original data when `Action=Replace`.

Matching Options section

Option Description

Case Sensitive
`true` or `false` value indicating whether the searches for should be case-sensitive. Default is `false`. Setting this to `true` accelerates searches.

Length (bytes)
Used in lieu of an End Pattern, the Length option specifies the length of the data (in bytes) to process following a matched Start Pattern. If `Inclusive=true`, then the length of the Start Pattern is not taken into account, even though it is also processed.

Request Operations section

Option Description

ReqSet Section
This option is used to specify the section for the name/value pair for a ReqSet, ReqAppend or ReqDelete action. ReqSet Section is required for these three actions.

ReqSet Field
ReqSet Field specifies the name of a name/value pair for a ReqSet, ReqAppend or ReqDelete action. ReqSet Field is required for these three actions.

ReqSet Result
When the start pattern is a regular expression, this option is used to produce a formatted value for a ReqSet or ReqAppend action. The Start Pattern expression should contain one or more "groups", defined by parentheses within the regular expression. ReqSet Result is a string containing literal text and placeholders for the data captured by the start pattern. For example:

```
Start Pattern=name="(.*?)" value="(.*?)"
ReqSet Result=Field
{g1}

value:
{g2}
```

Results in a value like the following:

```
Field-Foo-value: Bob
```

The first placeholder (`g1`) is replaced with the value from the first group in the regular expression. `g2` gets the second value, and so on. The result string is then used as the value for the ReqSet or ReqAppend action.

MD5 The MD5 true/false setting denotes whether the resulting data captured by the rule should be MD5 encoded.

Note: The MD5 option can be applied only if the Extended Privacy session agent is used. For more information, see "Extended Privacy Session Agent" on page 261.

- The default value is `false`.

Checksum

The Checksum true/false setting denotes whether the resulting data captured by the rule should have an Adler32 checksum applied to it. This checksum handles several cases not traditionally handled by checksums such as multiple errors that sum to 0 or rearranging of characters in the sequence.

The Checksum value is useful for comparing sensitive data where the user wants a low possibility of reverse lookup to obtain the original value. A good application of the Checksum value is to allow comparison of multiple attempts at entering a password. If the user mis-types the password from hit to hit, the Checksum will allow this case to be recorded without the password being revealed. In simply blocking the password data, you would not be able to compare subsequent hits to reveal the multiple attempts at entering the password.

- The default value is `false`.

Note:

- For ReqSet and ReqAppend, the value to set or append can be specified a couple different ways:
  1. You can use a literal string by setting Replace String to the desired text.
  2. You can pull data from the request or response using Section, Field, Value Name, Start Pattern or End Pattern or both.
- When using Start Pattern with one of these actions, the Repeat Count is always set to 1, which means that the first match is always used.
- Ignore Special is always `true` for these actions when Section is specified. There is no special handling for the urlfield or cookie sections with these actions.
- To clear the value for a field (name/value pair) without removing the entire field, set Replace String to an empty value:

  ```
  Replace String=
  ```

- All carriage-returns and linefeeds in the value string are replaced with `\r` and `\n`, respectively.
- Privacy changes are queued and applied after all actions are complete, which means that actions normally see the original data. ReqSet, ReqAppend and ReqDelete keep track of field additions, changes and deletions, so multiple changes to a single field can be done safely. For example, you can add a field and then concatenate additional data to the value. Changes made to field values are best done using ReqSet and ReqAppend.
  - Since the Replace action can affect any arbitrary piece of data in the request or response, it is not included in this change tracking.
- When using Field or Value Name with ReqSet or ReqAppend, you should specify only a single field or value name. If there are multiple names, the value for the last found item is used.
- For a ReqSet or ReqAppend, you should avoid specifying only a section to retrieve the value, which results in the value from the last field (name/value pair) in the section used for the ReqSet or ReqAppend.

Keys

The optional [Keys] section may be used to explicitly define privacy keys along with their encrypted value.

Note: This option is normally used only when the Privacy session agent is running on a machine other than the IBM Tealeaf CX server where the defined privacy keys are not directly accessible. In this case, the key IDs and encrypted key values must be copied from TMS to the Privacy session agent configuration file, which is then copied to the target machine.

You can add keys to the [Keys] section by clicking on the Add Key button in the Privacy Filter configuration editor.

Note: Do not rename a privacy key after you have created it. The encrypted value contains a reference to the name and cannot be modified after creation.

The key name and value should be obtained from keys generated by the Search Server configuration editor in the Tealeaf Management System. See “Privacy Keys” on page 115.

See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Pre-configured Filters

Tealeaf provides a number of pre-configured data privacy filters in the default Privacy configuration. Through TMS, you can enable, edit, and test the rules, actions, and tests for these filters.

The following sections document two pre-configured filters.

Blocking Data Filter

By default, Tealeaf includes rules and actions to recognize specific HTML comments in the response data and to block the data between them. Data may be bracketed by the web application in the following manner:

```
Your Social Security No. is <!--TLTIHB-->123-12-1234<!--TLTIHE-->
```

When this data filter is enabled, the data is rendered in Tealeaf as the following:

```
Your Social Security No. is <!--TLTIHB-->XXXXXXXXXXX<!--TLTIHE-->
```

Note: Tealeaf provides a utility for testing privacy filters. You may wish to use this utility for developing and testing this filter prior to deploying it through TMS. See “Privacy Tester Utility” on page 390.

1. Open the Privacy filter through TMS. See “Accessing the Privacy Editor” on page 294.
2. In the Privacy Editor, you must enable the action `TextBlockTags`. Find the entry and click **Edit**.
   a. In the **Action**, the Start Pattern and End Pattern values should match the HTML tags above.
   b. If there is whitespace between the tags that must be factored, you must apply a regular expression:

Note: Use of a regular expression in a privacy rule is an expensive operation. They should be avoided wherever possible. Instead, try to remove the whitespace between the tags.

1) Enter the following expression in the **Start Pattern** text-box and click the Regular Expression? checkbox:

```
<!--[ \t\r\n]*TLTIHB[ \t\r\n]*-->
```

2) Enter the following expression in the **End Pattern** text-box and click the Regular Expression? checkbox:

```
<!--[ \t\r\n]*TLTIHE[ \t\r\n]*-->
```

c. By default, the replacement character for each character between the tags is `X`. To use a different character, enter a value in the Strike Character textbox.

d. Review the other listed values.

e. Click **OK**.

3. Now, you must configure Rule 1 to execute this action.
   a. Under the Rules section, find Rule 1. Click **Edit**.
   b. Verify that the Enabled checkbox is selected.
   c. From the Actions drop-down, select `TextBlockTags`. Then, click **Add**.
   d. The TextBlockTags action has been added to the rule.
   e. Review the other listed values.
   f. Click **OK**.
4. For this filter, there are no Tests to configure.
5. Click **Save**. The `TextBlockTags` action has been enabled for Rule 1.
6. Create a TMS task to assign this configuration to all servers immediately. See "TMS Jobs Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

For more information on how to build web applications to utilize this filter and multiple levels of data security, see "Building Web Applications with Tealeaf in Mind" in the *IBM Tealeaf CX Installation Manual*.

Encrypting Data Filter

Similar to the previous section, Tealeaf can be configured to recognize specific HTML comments in the response data and to encrypt the data between them. Data may be bracketed by the web application in the following manner:

```
Your Social Security No. is <!--TLTENB-->123-12-1234<!--TLTENE-->
```

When this data filter is enabled, the data is rendered in Tealeaf as the following for Tealeaf users who do not have the appropriate permissions:

```
Your Social Security No. is <!--TLTENB-->@@@@@@@@@@<!--TLTENE-->
```

Tealeaf users with the appropriate user group permissions can see the data.

Note: Tealeaf provides a utility for testing privacy filters. You may wish to use this utility for developing and testing this filter prior to deploying it through TMS. See “Privacy Tester Utility” on page 390.

To create an encrypting filter for a specific set of users, please complete the detailed steps listed below.

Before you begin

If you have not done so already, create the user group that contains the users who can see the data.

1. Add the Tealeaf users to the group.
2. Generate a privacy key and assign it to that group. See "Generating privacy keys" on page 116.
3. Copy this value to the keyboard for later use.

In TMS

Note: Before you complete these steps, you should check to see if this Action has already been included in your Tealeaf system. Depending on your current build and whether you have upgraded it from a previous version, this Action may already be available for you. You may be required to assign the privacy key for the action. See "In Privacy.cfg" on page 311.

1. Open the Privacy filter through TMS. See "Accessing the Privacy Editor" on page 294.
2. In the Privacy Editor, you must create the action. In the Actions section, click **Add Action**.
   a. Provide a name for the action, such as `TextEncryptTags`.
   b. From the Action drop-down, select `Encrypt`. Additional options may appear.
   c. For the Key value, paste in the value that you created for the privacy key above.
   d. In the Group textbox, enter the name of the group that can see the data.
   e. From the Section drop-down, select `response`.
   f. The Start Pattern and End Pattern values should match the HTML tags below.
      - Set the Start Pattern: `<!--TLTENB-->`.
      - Set the End Pattern: `<!--TLTENE-->`.
   g. If there is whitespace between the tags that must be factored, you must apply a regular expression:

      Note: Use of a regular expression in a privacy rule is an expensive operation. They should be avoided wherever possible. Instead, try to remove the whitespace between the tags.

      1) Enter the following expression in the Start Pattern textbox and click the Regular Expression? checkbox:
         ```
         <!--[ \t\r\n]*TLTENB[ \t\r\n]*-->
         ```
      2) Enter the following expression in the End Pattern textbox and click the Regular Expression? checkbox:
         ```
         <!--[ \t\r\n]*TLTENE[ \t\r\n]*-->
         ```
   h. By default, the replacement character for each character between the tags is `X`. Typically, this character is reserved for blocking actions. Set this value to `@` in the Strike Character textbox.
   i. Review the other listed values.
   j. Click **OK**.
3. Now, you must configure Rule 1 to execute this action.
   a. Under the Rules section, find Rule 1. Click **Edit**.
   b. Verify that the Enabled checkbox is selected.
   c. From the Actions drop-down, select `TextEncryptTags`. Then, click **Add**.
   d. The TextEncryptTags action has been added to the rule.
   e. Review the other listed values.
   f. Click **OK**.

4. For this filter, there are no Tests to configure.
5. Click **Save**. The TextEncryptTags action has been enabled for Rule 1.
6. Create a TMS task to assign this configuration to all servers immediately. See "TMS Jobs Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

In Privacy.cfg

In the Privacy.cfg configuration file, the action looks like the following:

```
[TextEncryptTags]
Action=Encrypt
Key=DemoKey01
Section=response
Field=body
StartPattern=<!--TLTEHB-->
EndPattern=<!--TLTEHE-->
```

In the above configuration, the value DemoKey01 must be replaced with the privacy key used to decrypt the hidden data. See “Generating privacy keys” on page 116.

For more information on how to build web applications to utilize this filter and multiple levels of data security, see "Building Web Applications with Tealeaf in Mind" in the *IBM Tealeaf CX Installation Manual*.

Additional Pre-configured Filters

Additional filters have been provided in the Tealeaf Privacy.cfg configuration file.

- See “Accessing the Privacy Editor” on page 294.

Example Filters

The following section provides examples for how to use Privacy session agent to block or remove text.

Example - Filtering Employee Session Data

If your employees are regularly using your enterprise website, you may find it useful to filter out their session data from reporting while still capturing the information.

In the following solution, internal employee visitors are connecting to the company website from the same IP address (aaa.bbb.ccc.ddd). Through Privacy.cfg configuration, Tealeaf can universally identify the requesting application (TLT_APPLICATION_NAME) for employees with the value Employee.

Note: This solution must be deployed in the Tealeaf pipeline before the Tealeaf Reference session agent is applied.

In Privacy.cfg, make the following changes:

```
[Rule1]
ReqField=REMOTE_ADDR
ReqOp=EQ
ReqVal=aaa.bbb.ccc.ddd
Actions=Employee

[Employee]
Action=ReqSet
ReqSet Section=appdata
ReqSet Field=TLT_APPLICATION_NAME
Replace String=Employee
```

After you have completed the above configuration, be sure to enable the `Employee` value:
`System\Reference_Application.txt A xx employee`

To filter employee sessions:

- Employee sessions can then be easily filtered by Tealeaf users as needed based on `TLT_APPLICATION_NAME=Employee`.
- To find employee sessions, use Tealeaf search builder. In the `TLT_APPLICATION_NAME` value, enter `Employee`.
- All existing reports can be filtered for employee session data by using the Application Filter in charts.

  Note: The Windows `Privacy.cfg` file contains many examples of filtering operations.

Example - Text Blocking

Text blocking can be used to sanitize sensitive data such as credit card numbers or passwords from captured data that was used in earlier versions of IBM Tealeaf CX. In addition to the extended functionality, the Privacy session agent provides default rules and actions that emulate the behavior of the old Text Blocking session agent.

Note: By default, the PCA is configured to sanitize all user input data from form fields for security purposes. If needed, you can disable this setting through the PCA Web Console and manage data privacy for fields on an individual field basis. This sanitization is managed through the `TextBlockURLFields` action configured by default in Rule 1. See "PCA Web Console - Rules Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

Note: Tealeaf customers are responsible for determining which information to sanitize, identifying the fields and locations of the information, implementing Privacy session agent rules and actions (and optional metadata tags), and maintaining these settings over time.

- The following sections describe how to block specific data fields in the request and response. By default, Tealeaf provides filtering rules and actions to block text in the response, which can be modified and enabled to meet your web application requirements. See “Blocking Data Filter” on page 308.

Method 1: Request File Changes

To sanitize sensitive data in URL fields you can use the TextBlockURLFields_WhiteList action in the provided Privacy session agent configuration file (Privacy.cfg). By default, this action is run as part of Rule1.

To identify the fields to block, specify the field names in the Value Name option in the TextBlockURLFields_WhiteList action.

Method 2: Response File Changes

All sensitive field names (e.g., primaryApplicant_SocialSecurityNumber) must be added to the TextBlockURLFields_WhiteList action (or similar Privacy session agent action) in order to block users from viewing this information in the Request/Response view of the IBM Tealeaf CX RealiTea Viewer.

Method 3: Multi-Line Text Blocking in Response

Suppose you have the following HTML in the response that you would like to block:

```
<b>Account Number: </b>

7777777777
</td>
```

You can create the following privacy action section to block this text:

```
[BlockAccountNumber]
Action=Replace
Section=response
Field=body
StartPattern=<b>Account Number:
EndPattern=</td>
Inclusive=True
ReplaceString=<b>Account Number: XXXXXXXX </b> </td>
```

Example - Enabling Search of Encrypted or Blocked Fields

In some situations, you may wish to enable a restricted set of users to search sensitive data that has been encrypted or blocked. You can create privacy filters to copy the sensitive data to an MD5-hashed field and then encrypt or block the original field. Then, you can configure a search template to include the new version of the field and to apply MD5 to the search term to return the original value.

Note: The MD5 option can be applied only if the Extended Privacy session agent is used. For more information, see “Extended Privacy Session Agent” on page 261.

Limitations

Note: The following steps do provide a means of accessing blocked or sensitive data that you might otherwise wish to protect. If you are concerned about access to this newly created field, please do the following:

- Review the users and groups that have access to configuring search templates through their menu profiles. See "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*.
- You may be able to create one or more events to segment access to the search field by user groups. See “Data Segmentation” on page 128.

Search fields that have an MD5 applied to them must be exact matches.

- Wildcards are not available.
- Hyphens and other punctuation may be removed in the search field. For example, the original data:

  ```
  4217-5689-12
  ```

  becomes the following MD5-hashed field value:

  ```
  4217568912
  ```

Users who are searching an MD5-hashed field must be informed of these limitations.

Configuration

Suppose that a contact phone number field needs to be enabled via MD5 search and blocked from common access. This value is stored in the request as `CONTACT_PHONE`. Values are stored in `XXX-XXX-XXXX` format.

1. Open the Privacy Filter through TMS.
   a. In the WorldView tab, click the Transport Service node.
   b. Click **Privacy Filter configuration**.
   c. Click **View/Edit** in the Config Actions panel.
      - See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
2. The Privacy Filter configuration opens.
3. Create an action to copy the field `CONTACT_PHONE` to `CON_PHONE_HASH` in the `[appdata]` section, where it is automatically indexed.
   a. Click **Add Action**.
   b. The following fields must be specified. The others are optional:

      Option Description

      `Name` Enter a name for the action. This name must be unique among all action. For our example, call it `CopyContactPhoneToHash`.

      `Action` Set this value to `ReqSet`, which sets or replaces the value for the specified name/value pair in the request. Creates the name/value pair if it doesn't exist.

      `Section`
      The Section option is used to identify the name of the section containing the data to process. You can leave it blank, which scans the entire request buffer.

      `Field` For our example, enter `CONTACT_PHONE`.

      `Value Name`
      Leave this value blank.

      `Invert Action`
      Set this value to `false`.

      `Start Pattern`
      Leave this value blank.

      `End Pattern`
      Leave this value blank.

      `ReqSet Section`
      Set this value to `appdata` to place the name/value pair in the `[appdata]` section.

      `ReqSet Field`
      Set this value to `CON_PHONE_HASH`.

      `ReqSet Result`
      Leave this value blank.

      `MD5` Set this value to `true` to apply an MD5 hash to the field. Later, the search field has the MD5 applied to the entered string to retrieve values from the new field.

      `Checksum`
      Set this value to `false`.
   c. Save the new `CopyContactPhoneToHash` action.
4. Create an action to block the data in `CONTACT_PHONE`.
   a. Click **Add Action**.
   b. The following fields must be specified. The others are optional:

Option Description

Name Enter a name for the action. This name must be unique among all action. For our example, call it `BlockContactPhone`.

Action This example uses `Block`, which blocks data. You may also choose `Encrypt`.

Section
The Section option is used to identify the name of the section containing the data to process. You can leave it blank, which scans the entire request buffer.

Field For our example, enter `CONTACT_PHONE`.

Value Name
Leave this value blank.

Invert Action
Set this value to `false`.

Start Pattern
Leave this value blank.

End Pattern
Leave this value blank.

Strike Character
Strike Character is used to replace the original data that is blocked or encrypted with an alphanumeric character. For this blocking example, use `X`.

Strike Length
Leave this value blank.

Blocking Mask
The Blocking Mask value is a regular expression that specifies which characters in the found data are replaced with the strike character.

Note: Be careful when using Blocking Mask. If the data does not match the regular expression specified for Blocking Mask then the data is not blocked or encrypted.

Replace String
Leave this value blank.

c. Save the new `BlockContactPhone` action.

5. Create a rule to look for the field `CONTACT_PHONE`. This rule evaluates each hit to determine if it contains the field.
   a. Click **Add Rule**.
   b. The following fields must be specified. The others are optional:

Option Description

Name Enter a name for the rule. Rule names must be in the form of `Rule + Sequential Number`. See "Rule naming conventions" on page 295.

ReqField
Enter the name of the field to look for. In our example, this field is `CONTACT_PHONE`.

ReqOp For this rule, select `exists`, which evaluates to `true` if the field exists in the data.

Stop Processing
Set this value to `false` to continue processing further rules when this rule evaluates to `true`.

Enabled
Set this value to `true`.

Actions
Select the actions you previous created. You must select them so that they appear in the following order: 1) `CopyContactPhoneToHash`, 2) `BlockContactPhone`

Note: The copy action must be executed before the block or encrypting action.

Tests For this example, no test is required.

c. To save the rule, click **OK**.

6. Click **Save** to save your changes.
7. Configure a task to push the changes to all servers.
8. You can configure a search template to include the field `CON_PHONE_HASH`.
   - The field should be included in a completed search template.
   - The field must be configured to have MD5 hashing enabled.
   - Users of the search template must be informed that they should not insert dashes `-` in their search strings of this field. An example value might be `4154958000`.
   - See "Configuring Search Templates" in the *IBM Tealeaf cxImpact Administration Manual*.
9. You can optionally create a session list template to include this new field value in the displayed output. See "Session List Templates" in the *IBM Tealeaf cxImpact Administration Manual*.

   Note: Values do not become available for search using a completed search template until a completed session containing the `CON_PHONE_HASH` has been captured and indexed.

Example - Existence of a request field means deleting a request section

Suppose the request data for your web application contains a credit card field (`CREDIT_CARD_NO`), whose value you wish to block. Additionally, you want to block the fieldname itself for extra security, and requests that include the field also include a section called `[CustInfo]` that you want to remove.

You can manage these tasks by doing the following rules configuration.

1. Create an action to delete the request variable:
   - Name: `Del_CREDIT_CARD_NO`
   - Action: `ReqDelete`
   - Section: Leave blank
   - Field: `CREDIT_CARD_NO`
2. Create an action to delete the `[CustInfo]` section:
   - Name: `Del_CustInfo`
   - Action: `ReqDelete`
   - Section: `CustInfo`

- Field: Leave blank

3. Create a rule with the following values:
   - ReqField: `CREDIT_CARD_NO`
   - ReqOp: `exists`
   - Enabled: `true`
   - Actions:
     - `Del_CREDIT_CARD_NO`
     - `Del_CustInfo`

Example - Adding request data for indexing

To enable improved search performance, Tealeaf scans completed sessions for a predefined set of data that is typically of use in locating sessions. The Portal and RTV then use these indexes to quickly locate sessions based on search criteria that you enter. For many customers, this dataset is sufficient to enable effective search for sessions of interest.

Indexes are not used for searching active sessions. In some cases, you may decide that some session data that is not available for search by default should be accessible, for example:

- You have created pipeline rules that insert application-specific data into the request.
- You have deployed IBM Tealeaf CX UI Capture for AJAX, which enables the capture of user interface events from the visitor's browser.
  In the above circumstances, the data may not be automatically indexed for search. Using one of the provided methods, you can make this data available for search through indexed data or event values. Using privacy rules, you can move data from anywhere in the response or the request into the `[appdata]` section of the request, where it is automatically indexed for search.

  Note: Adding index data is considered a Tealeaf administrator task. Adding data to be indexed for search increases the size of the indexes stored in the Processing Server. Depending on the volume of increased data that is marked for indexing, indexes can grow considerably and may impact available disk space and performance of the Processing Server. Before you begin adding data, you should review your goals with IT staff.
- See "Adding Other Fields for Indexing and Search" on page 52.

Enabling Privacy through TMS

You can enable the Privacy session agent through TMS.

To enable Privacy session agent:

1. Access TMS through the Portal. See "Adding and Configuring the Session Agent" on page 292.
2. Drill-down on the Transport Service node for the server you wish to configure.
3. Click **Transport Service configuration**.
4. Click **View**.
5. To edit the displayed version, click **Edit**.
6. The window displays all pipelines and their session agents currently available in your Tealeaf system.

7. Pipelines are defined by name and port in the `[Globals]` section. For more information on creating new pipelines, see "Building a Pipeline in the Configuration File" on page 218.

Note: The Privacy session agent should be **after** the Decouple session agent (and Inflate session agent if responses are compressed) in the pipeline, but before most other session agents.

Enabling Privacy through `TealeafCaptureSocket.cfg`

A session agent, such as the Privacy session agent, is enabled by creating a pointer in this file to its configuration in the configuration section for the session agent that occurs directly upstream of it.

1. To integrate the Privacy session agent session agent, you must edit the `DownStreamConfigSection` property of the session agent's configuration just before it in the pipeline.
2. For example, if the upstream session agent is [DecoupleEx], then in that session agent's configuration, you must set the following property: `DownStreamConfigSection=PrivacyEx`.

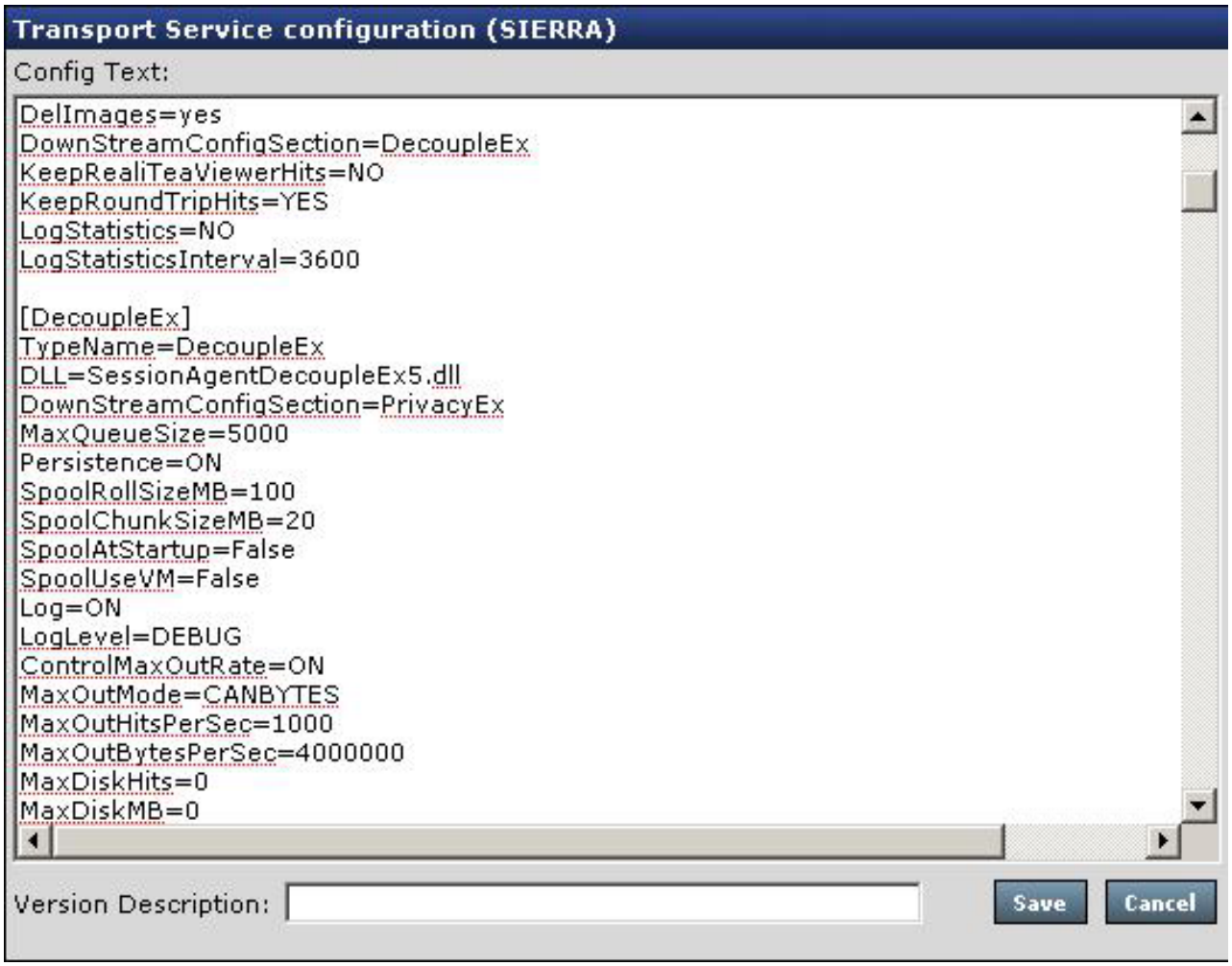

Figure 33. Enabling Privacy through TMS

3. In the [Privacy] section, you can modify the properties to reflect the session agent. Items with a pound sign (#) in front of them are disabled.

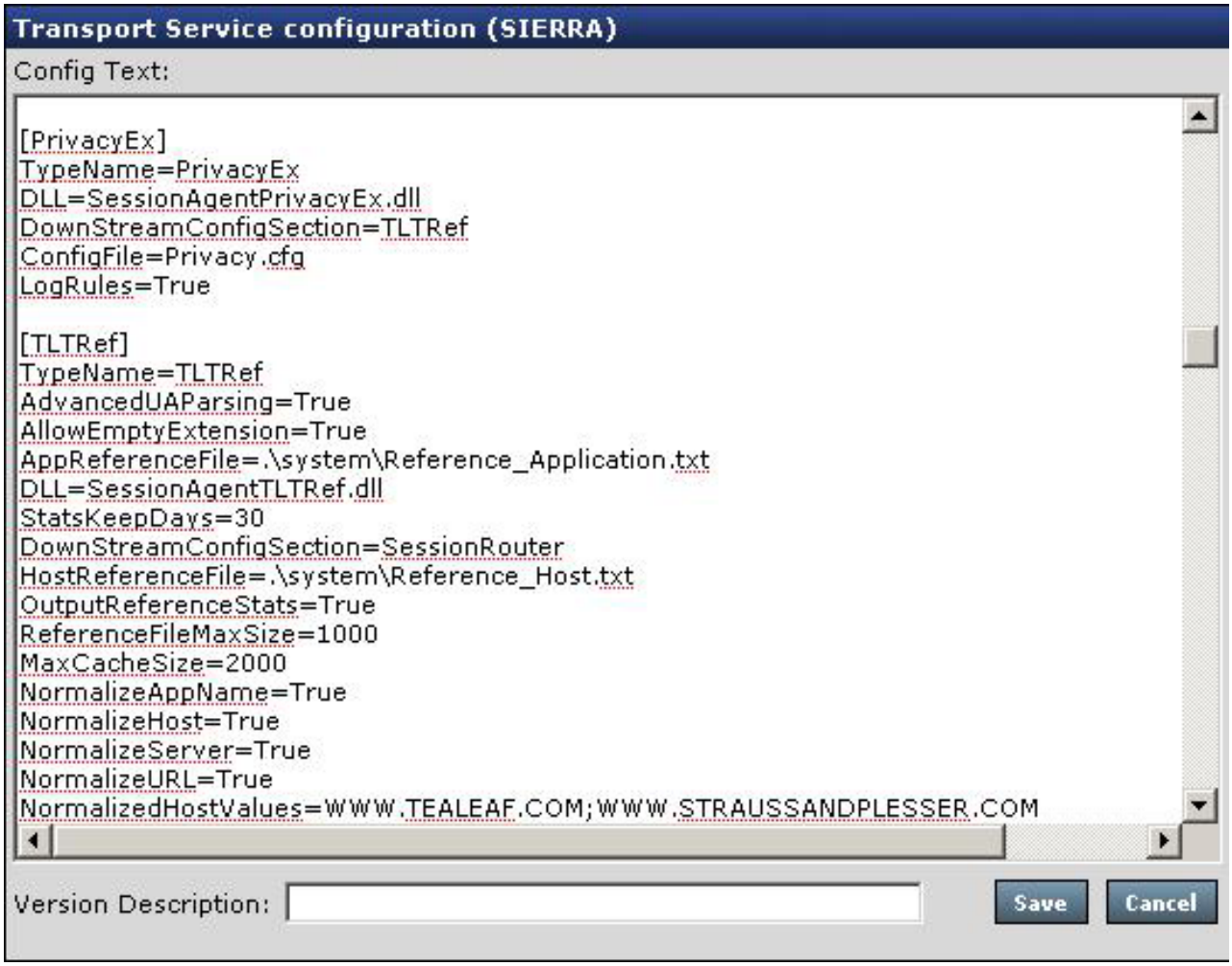

Figure 34. Enabling Privacy

4. Set the global configuration settings. The following table lists the configuration settings for the session agent:

   Note:

   - **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
   - **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 24. Enabling Privacy through `TealeafCaptureSocket.cfg`

Display	Name	Description
DLL	DLL	The .DLL file used by the session agent. Do not change this value.

Table 24. Enabling Privacy through `TealeafCaptureSocket.cfg` (continued)

Display	Name	Description
`Config File`	`ConfigFile`	File containing the privacy rules, actions, and tests. The default value for ConfigFile is `Privacy.cfg`, which is the default template file that is installed in the Tealeaf install directory.\ This file contains multiple example rules and detailed documentation on implementation. For additional information, please review this file through TMS. **Note:** Before you enable the Privacy session agent, you should configure and test the rules and action of your session agent. See "Accessing the Privacy Editor" on page 294.
`Show Rules in Event Log`	`LogRules`	When set to `true`, this option enables the writing of rules and their actions into the hit. See "Logging for Privacy Session Agent."
`Log Level`	`LogLevel`	When `LogRules` is enabled, this value defines the logging level. See "Logging for Privacy Session Agent."

5. In the **Version Description** field, enter a description of the changes in this version. For example, `Enabled Privacy session agent`.

   Note: If the Transport Service is on a server other than the TMS master server, you must push the configuration changes to the Transport Service server. See "TMS Jobs Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
6. Click **Save** to save your changes.

Privacy session agent has been enabled in the configured pipeline.

Logging for Privacy Session Agent

When logging is enabled, log messages are written into the `[privacylog]` section of the request. Through RTV or Browser Based Replay, you can review hit data to evaluate how the Privacy session agent rules are being processed.

Note: Privacy session agent logging is used mostly for debugging purposes. To enable debugging in Privacy session agent, set the following property values in the `[PrivacyEx]` section:

- `LogRules - true`
- `LogLevel - DEBUG`

Additional documentation is available in the notes inside the `[PrivacyEx]` section. See the preceding screenshot.

Applying Privacy

Privacy rules may be applied in multiple areas of the Tealeaf system. See "Managing Data Privacy in Tealeaf CX" in the *IBM Tealeaf CX Installation Manual*.

Testing Privacy

Privacy rules can be developed in the following areas:

- **TMS:** See “Accessing the Privacy Editor” on page 294.
- **RTV:** Privacy rules can be tested against selected sessions. See "RealiTea Viewer - Privacy Tester" in the *IBM Tealeaf RealiTea Viewer User Manual*.

Real-Time Monitoring and Alert (RTA) Session Agent

Real-Time Alerts provides true real-time processing on every hit captured by Tealeaf. RTA can be used for the following purposes:

- **Hit Deletion** - Delete hits containing unwanted data such as ping or "keep-alive" hits, and images.
- **Session sampling** - Specify a percentage of sessions to delete from the capture.
- **Event Detection** - Detect and alert on specified events such as HTTP errors and Long Page Generation times before hits enter the Canister.

Overview

You can configure RTA to run three types of tests on the data:

- **REQTest** - Tests against any field in the request. This test searches the URL string for a specified value, which can be a status code, query string, or similar.
- **RSPSrch** - Performs a text search of the response. This test searches the text that is returned from the server based on the request. For example, you can search for a partial transaction.
- **SessPCT** - Randomly selects a specified percentage of sessions. This test can be used to delete a specified percentage of the sessions.

  SessPCT knows the total number of sessions by taking bytes 4 - 7 of the session ID and converting them to an integer, which is then modulo'd by 101. The resulting number is 0 - 100. A full session contains an even number of integers 0 - 100. When a valid modulo is received, it is compared against the rule parameter.

After the test is performed and all of the test rules are met, RTA can take one of the following actions:

- **APPEvent** - Generate a Tealeaf Application Event in the request
- **Delete** - Delete the hit
- **EventLOG** - Create an entry in the NT Event Log
- **Email** - Send email
- **SetVar** - Set a variable

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Enabling RTA

You can enable the Real-Time session agent by adding it to your Windows pipeline through TMS.

To enable RTA:

1. Login to the Tealeaf Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **TMS**.
3. In Servers view, click the Transport Service node.
4. Click **Transport Service configuration**.
5. Click **View/Edit**.
6. The Pipeline Editor is displayed. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
7. From the Available Session Agents panel, drag and drop RTA into your pipeline.
8. The Edit Session Agent dialog appears. See "Configuration Settings."
9. Edit the properties. Click **OK**.
10. To save your changes in the Pipeline Editor, click **Save**.

Configuration Settings

The following configuration settings are available for this session agent:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 25. Configuration Settings

Display Name	Name	Description
`Script Trace`	`ScriptTrace`	Specifies whether or not to enable script debugging functionality. Set this option as follows: `ScriptTrace=OFF` or `ScriptTrace=ON`

Configuring RTA Tests in TMS

The tests and rules of the Real-Time Alerting session agent can be configured through the Tealeaf Management System in the Tealeaf Portal.

To configure RTA:

1. Login to the Tealeaf Portal as an administrator.
2. In the Portal menu, select **Tealeaf** > **TMS**.
3. In Servers view, click the Transport Service node.
4. Click **RTA configuration**.
5. Click **View/Edit**.
6. The RTA `.ini` configuration file is displayed. For more information on TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Editing the RTA.ini File

The RTA.ini file is where rules for RTA are configured. Complete instructions for how to configure RTA are in the RTA.ini file, accessible through TMS.

The RTA.ini file contains seven sample rules that can be used as templates.

- The rules are implemented in loose XML format with start and end tags.
- There is no limit on the number of tests a rule may have.
- Rules are processed in the order specified by the NUM= parameter and not in the order in which they appear in the file.
- Rules can use operators such as Greater Than, Equal To, Not Equal to, etc. The STOPRULES parameter stops processing of rules.

Rule Limits

An individual instance of the RTA session agent cannot contain more than 150 rules. The RTA.ini can contain no more than 150 rules.

- Additionally, the NUM= parameter cannot use a value greater than 150.
- The workaround is to deploy a second instance of RTA in the same pipeline using a different .ini file.

Sample RTA Rules

Reduce Session Count rule

This rule reduces the session count by approximately 10 percent.

Note: The STOPRULES directive stops further processing of rules if the rule is true.

```
<RULE NUM="1" STATUS="DISABLED" DESCRIPTION="Delete 10% of Sessions"
   STOPRULES="YES">
<GROUP TYPE="SessPCT" PERCENT="10" >
</GROUP>
<GROUP TYPE="DELETE" >
</GROUP>
</RULE>
```

HTTP 400 Errors or Greater rule

This rule tests for HTTP errors 400 or greater, except 404 errors, which can frequently occur due to user typos.

The action is to create an entry in the NT Event Log:

```
<RULE NUM="5" STATUS="DISABLED" DESCRIPTION="HTTP Errors">
<GROUP TYPE="REQTest" REQF="StatusCode" REQOP="GT" REQVAL="399" >
</GROUP>
<GROUP TYPE="REQTest" REQF="StatusCode" REQOP="NE" REQVAL="404" >
</GROUP>
<GROUP TYPE="EventLog" TYPE="WARNING" PRIORITY="Normal"
   CATEGORY="3xx - 4xx HTTP Errors">
</GROUP>
</RULE>
```

Long Page Generation Time rule

This rule tests for Page Generation time greater than 60 seconds:

```
<RULE NUM="6" STATUS="DISABLED" DESCRIPTION="Page Response Time &gt 300 Secs">
<GROUP TYPE="REQTest" REQF="TL_ResponseTime" REQOP="GT" REQVAL="300" >
</GROUP>
```

```
<GROUP TYPE="EventLog" TYPE="ERROR" PRIORITY="Severe"
   CATEGORY="Page Generation Error">
</GROUP>
</RULE>
```

HTTP 500 errors or Greater rule

This rule tests for HTTP errors 500 or greater, which are internal server errors. In addition to creating an ERROR type event log entry, it also creates an APPEvent.

- The NOT operator is used in this rule.

```
<RULE NUM="8" STATUS="DISABLED" DESCRIPTION="HTTP 500 Errors">
<GROUP TYPE="REQTest" NOT="YES" REQF="StatusCode" REQOP="LT" REQVAL="500" >
</GROUP>
<GROUP TYPE="APPEvent" TYPE="ERROR" PRIORITY="High"
   CATEGORY="HTTP 500 Errors">
</GROUP>
</RULE>
```

Search Response Buffer rule

This example searches the response buffer for the string Partial Transaction, only for server non-cached pages (HTTP Status Code 302).

```
<RULE NUM="9" STATUS="DISABLED" DESCRIPTION="Partial Transaction" >
<GROUP TYPE="REQTest" REQF="StatusCode" REQOP="NE" REQVAL="302" >
</GROUP>
<GROUP TYPE="RSPSrch" SRCHSTR="Partial Transaction" SRCHCASE="YES"
   REGEXPR="NO" >
</GROUP>
<GROUP TYPE="Email" To="John@doe.com,Mary@doe.com" From="From@doe.com"
   Subject="Partial Server Transaction" Hostname="Mailhost" Port="25">
</GROUP>
<GROUP TYPE="EventLog" TYPE="WARNING" PRIORITY="Low"
   CATEGORY="Partial Transaction">
</GROUP>
</RULE>
```

Search Request Buffer rule

This example searches the REQ buffer for the string APPEVENT TYPE=&qout, as found in an APPEvent.

- The ReqTest does only name/value operations.

```
<RULE NUM="10" STATUS="DISABLED" DESCRIPTION="Partial Transaction" >
<GROUP TYPE="RSPSrch" SRCHSTR="APPEVENT TYPE=&qout" SRCHCASE="YES"
   REGEXPR="NO" SRCHREQ="YES" >
</GROUP>
<GROUP TYPE="EventLog" TYPE="WARNING" PRIORITY="Low"
   CATEGORY="APPEvent Found">
</GROUP>
</RULE>
```

Example Output

The following is an example of an Event Log entry generated by the RTA Event Log option:

```
Tealeaf Real Time Alert

_____________________
Page/URL - /postinfo.html
Type - APP HTTP
Sts Code - 200
Sesn ID - B77674C64D1B68945A0A058A28EE5021
```

```
Hit ID - 20010614155628_168A
Error Summary - Priority: Ultra-High - Category: HTTP - Description: ASP error
Rsp Time - 0 seconds RequestTime: 2001-06-14T15:56:28.168Z ResponseTime:
2001-06-14T15:56:28.268Z Miscellaneous Server: localhost - Page Size: 2542
Bytes - Referring URL:
```

The following is an example of the XML output generated by the RTA AppEvent option:

```
[xml1]
<APPEVENT TYPE="SessionAgent" EVENT="ERROR"
   SESSIONID="5A7CB3DF4CABFF43E5478DB111466B50" HITID="20010615202144_561A">
<GROUP TYPE="ERROR"> <VAR NAME="CATEGORY" VALUE="Test of Ctype1"/>
<VAR NAME="STATUS_CODE" VALUE="200"/>
<VAR NAME="DESCRIPTION" VALUE="Any Page Response Time >10 Secs"/>
</GROUP>
</APPEVENT>
```

Tealeaf Session Agents

- “Adding a Session Agent” on page 226
- “Archive Session Agent” on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Canister Session Agent” on page 236
- “Cookie Parser Session Agent” on page 238
- “Data Drop Session Agent” on page 241
- “Data Parser Session Agent” on page 246
- “Decouple Session Agent” on page 250
- “Extended Decoupler Session Agent” on page 252
- “Extended Privacy Session Agent” on page 261
- “Health-Based Routing (HBR) Session Agent” on page 263
- “Inflate Session Agent” on page 271
- “JSON Mobile Parser Session Agent” on page 275
- “Managed Code Session Agent” on page 287
- “Null Session Agent” on page 290
- “Privacy Session Agent” on page 291
- Real-Time Monitoring and Alert (RTA) Session Agent
- “Response Tags to Request Session Agent” on page 326
- “RTA Split Session Agent” on page 328
- “Sessioning Session Agent” on page 332
- “Session Router Session Agent” on page 330
- “Socket Session Agent” on page 335
- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- “Tealeaf Sessioning Session Agent” on page 360
- “TimeGrades Session Agent” on page 366
- “TLI Session Agent” on page 368
- “URL Decode Session Agent” on page 382

Response Tags to Request Session Agent

RSPTags2REQ scrapes the RSP buffer for name/value pairs and puts them into the REQ [appdata] section so that they are indexed and searchable. It is primarily intended for sites and products that already employ page tagging and use those tags.

- For more information, see http://www.coremetrics.com.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See "Adding a Session Agent" on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the TealeafCaptureSocket.cfg file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

The following configuration settings are available for RSPTags2REQ:

- **Display Name** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **Name** values are displayed in TealeafCaptureSocket.cfg.

Table 26. Response Tags to Request Session Agent

Display Name	Name	Description
Response Buffer Start Pattern	RSPStartPatt	Search Start of the RSP buffer, which is used to limit the searching of the RSP buffer.
Response Buffer End Pattern	RSPEndPatt	Search End of the RSP buffer.
Response Name/Value Pair Delimiter	RSPNameValueDelimiter	Defines the delimiter between the name/value pairs.
RSP Var Delimiter	RSPVarDelimiter	Name/value delimiter. Default value is =.
RSP Tags To Search For	RSPTags	Semicolon-delimited list of variables to search. If the pipe symbol (|) is present, the left side is the RSP buffer variable name and the right side is the name for the REQ [appdata] section. If no pipe symbol is present, then the same name is used.
Script Trace	ScriptTrace	When ON, script tracing is enabled, which is useful for debugging. The default value is OFF.

Example Configuration

In the following example, assume the RSP buffer is page tagged in the following manner:

```
...
<!-- PageTagging Start -->
<!-- Page Tagging Comments-->
<script language="JavaScript" type="text/javascript">
<!--
var TL_Name="Tea Pots";
var TL_Category="Clay";
var TL_Type="Dual";
var TL_var1="";
var TL_var2="Teal";
var TL_var3="6 cup set";
var TL_var4="";
var TL_var5="Burn Pad";
*/-->
</script>
...
```

The following is a sample configuration, based on the above where Name, var2, var3 and var4 are to be extracted:

```
RSPStartPatt=<!-- PageTaggingStart
RSPEndPatt=*/-->
RSPVarDelimiter==
RSPTags=TL_Name|Item;TL_var2|Color;TL_var3|Version;TL_var5|Accessory
```

This configuration would result in the REQ `[appdata]` section looking like the following:

```
[appdata]
Item=Tea Pots
Color=Teal
Version=6 cup set
Accessory=Burn Pad
```

Tealeaf Session Agents

- "Adding a Session Agent" on page 226
- "Archive Session Agent" on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Canister Session Agent" on page 236
- "Cookie Parser Session Agent" on page 238
- "Data Drop Session Agent" on page 241
- "Data Parser Session Agent" on page 246
- "Decouple Session Agent" on page 250
- "Extended Decoupler Session Agent" on page 252
- "Extended Privacy Session Agent" on page 261
- "Health-Based Routing (HBR) Session Agent" on page 263
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- "JSON Mobile Parser Session Agent" on page 275
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- Response Tags to Request Session Agent

- “RTA Split Session Agent”
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- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
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RTA Split Session Agent

Along with Session Router, RTASplit can be used to route traffic to child pipelines. RTASplit can use rich RTA conditions to determine routing. Routing can be based on the contents of one or more REQ values. For example, you can route based on URL. If the URL includes `tealeaf`, then route to `childpipe1`. Else, route to `childpipe2`.

- The Session Router session agent is used for cases of session routing by percentages. See “Session Router Session Agent” on page 330.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

The following configuration settings are available for this session agent:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 27. RTA Split Session Agent

Display Name	Name	Description
`Script Trace`	`ScriptTrace`	When set to `ON`, script tracing is enabled, which is useful for debugging. The default value is `OFF`.

Table 27. RTA Split Session Agent (continued)

Display Name	Name	Description
Config File	RTAIni	The filename of the configuration file for the session agent. By default, the filename is RTASplit.ini. • Additional configuration documentation is provided in the .ini file.

Configuration Example

The RTA Split session agent is used to divert static content out of a Windows processing pipeline to the TLI server and pipeline for insertion into a static archive. A **static archive** is a library of static content captured on a daily basis for purposes of long-terms storage for replay and auditing.

- For more information on configuring RTA Split for use with static archives, see “TLI Session Agent” on page 368.
- For more information on static archives, see "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

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Session Router Session Agent

The Session Router session agent is used for routing traffic, which is necessary in a multi-processor or multi-canister environment, where the Transport Service must route traffic to one or more processing servers.

Routing is always done on a session percentage basis. For example, in a system with a Transport component and three Processor components to receive data, the Session Router agent can be configured to send each processing component a third of the traffic.

Note: For some deployments of the Processing Server, this session agent is included in the default pipeline and is required. See "CX Pipeline Configuration" on page 214.

Note: Since this agent routes traffic at the session level, the data must be properly sessionized beforehand.

Note: If traffic is segregated using a method other than percentages, then the RTASplit session agent is required.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See "Adding a Session Agent" on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

The following configuration settings are available for this session agent:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 28. Session Router Session Agent

Display Name	Name	Description
`Init Script`	`InitScript`	TCL script that initializes this session agent. The default value is `PipelineSplitterCFG.tcl`.
`Keep TEMP Config`	`KeepTEMPConfig`	When set to `true`, temporary pipeline configuration files are retained, which is useful for debugging. The default value is `false`.

Table 28. Session Router Session Agent (continued)

Display Name	Name	Description
Pipeline (0)	PipelineEx0	This setting contains the default pipeline configuration, which sends hits to next session agent in the current pipeline. This default configuration is the following: `Traffic SessPct=0-100`
Pipeline (1)	PipelineEx1	This setting can be used for routing statistics hits to the appropriate pipeline. The default setting is the following: `Traffic Stats || Decouple || Null`

Sample Configuration

Sample SessionRouter section from `TealeafCaptureSocket.cfg`:

```
[SessionRouter]
TypeName=SessionRouter
DLL=SessionAgentPipelineSplitter.dll
DownStreamConfigSection=Null
InitScript=PipelineSplitterCFG.tcl
KeepTEMPConfig=False
PipelineEx0=Traffic SessPct=0-100
PipelineEx1=Traffic Stats || Decouple || Socket TeaBag0:1966
PipelineEx2=Traffic SessPct=0-50 || Decouple ||
   Socket TeaBag1:1966
PipelineEx3=Traffic SessPct=51-100 || Decouple ||
   Socket TeaBag2:1966 UseSSL=true
```

The above example has a main pipeline (PipelineEx0) and three child pipelines, one of which is the Traffic Status pipeline and the other two receiving 50% of the traffic.

Pipe 0 (`PipelineEx0`) is the main pipeline, as specified in `TealeafCaptureSocket.cfg`. Normally, SessionRouter terminates the main pipeline, as in the above example where the DownStreamConfigSection points to `Null`.

All the other pipelines are considered to be child pipelines to SessionAgentSessionRouter.

- The stats pipeline is for statistics hits, which are routed to the Reporting Server.
- The two session traffic pipelines route the two halves of the traffic to the two processing servers.
- The Session Router session agent supports the creation of up to 64 child pipelines.

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Sessioning Session Agent

The Sessioning session agent uses a single REQ buffer field and applies the MD5 hashing algorithm. MD5 takes a single field of arbitrary size and creates a 32-byte hex-ASCII string, similar to the 32-byte REQ buffer TLTSID value.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

MD5 Hashing Method

Configuration for MD5 consists of the following parameters:

Note: MD5 hash is limited to only one sessioning parameter.

- `PrimarySessMD5=True` (optional)
- `PrimarySessField=JSESSIOND` (required)

- `PrimarySessFieldMaskOFF=0 35` (optional)
- `PrimaryCaseInsensitive=true` (optional)

Configuration Settings

The following configuration settings are available for this session agent:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 29. Configuration Settings

Display Name	Name	Description
`Sessioning Field`	`PrimarySessField`	Specifies the primary REQ field to sessionize. This value can be any field in the REQ buffer, `[urlfield]` name/value pair, or `REMOTE_ADDR` in the `[env]` section. • You can specify multiple primary session fields. See “Alternate Sessioning Fields” on page 334. **Note:** If this field is a HTTP Cookie parameter, verify that this script is configured after CookieParser.
`Field Offsets`	`PrimarySessFieldMaskOff`	Allows for specifying the SessField to be some "substring" of the REQ field. This is a simple specification of the character start and end offsets. Normally these are integer values, but the use of the meta-parameter `end` is also allowed. Offsets are 0-based values. The following are some examples: `PrimarySessFieldMaskOff=0 end` (entire string) `PrimarySessFieldMaskOff=0 19` (first 20 characters) `PrimarySessFieldMaskOff=14 end-4` (15th character to 4th from the end) `PrimarySessFieldMaskOff=end-9 end-2` (9th from the end to 2nd from the end)
`Section`	`PrimarySessFieldSection`	Optional field that indicates which section of the REQ buffer the PrimarySessField is found. By default, the entire request is searched for the field specified by PrimarySessField.

Table 29. Configuration Settings (continued)

Display Name	Name	Description
Case Insensitive	PrimaryCaseInsensitive	When set to true, the sessioning parameter may have mixed-case values. • Where possible, this option should be avoided, as case-insensitive matching is more costly than case-sensitive matching. • This setting applies only to the parameter name and **not** the parameter value.

Alternate Sessioning Fields

This capability allows multiple field names to be specified for PrimarySessField as a comma-delimited list. Each field name may optionally be prefixed with a section name (e.g., `cookies:sessionid`).

The following is an example:

```
PrimarySessField=SESSIONID,SESSIONID2,cookies:OTHER_SESSIONID
```

Note:

- If PrimarySessFieldSection is specified, then it applies to all fields that don't have an explicit section name.
- The PrimarySessFieldMaskOff and PrimaryCaseInsensitive values apply to all sessioning fields.
- SASessioning looks for the sessioning field(s) in the order listed.

Mobile-Related Session Agents

This session agent can be used as part of capturing and processing JSON messages submitted from one of the Tealeaf client frameworks and splitting these messages into separate hits in the Windows pipeline. This method is the legacy method.

These client framework versions were introduced in Release 8.4 and have been superseded by the step-based method of messaging, beginning in Release 8.5.

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Socket Session Agent

The Socket session agent transfers captured data to another computer through a TCP/IP network, such as a server inside a firewall.

Note: When enabled, the Socket session agent is the end of the pipeline, so the `-DownStreamConfigSection` option is not required.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

- For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

The following configuration settings are available for this session agent:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 30. Socket Session Agent

Display Name	Name	Description
Server	Server	Specifies the name or numeric IP address of the remote machine to which the captured data is sent.
Port	Port	Specifies the network IP port number to be used for the data transfer.
Use SSL	UseSSL	Specifies whether an SSL connection should be used to transfer capture data to the server. **Note:** The specified port on the server must be configured for SSL to use this option.

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Statistics Logger Session Agent

The Stats Logger session agent is a terminating pipeline session agent that can be used to forward statistical information about Tealeaf components for logging in the `STATISTICS` database.

Tealeaf components like the IBM Tealeaf CX Passive Capture Application and the DecoupleEx session agent can insert hits into the pipeline, which contain statistical information about the component's operations. When the Stats Logger session agent is enabled, these statistics hits are assembled for insertion into the `STATISTICS` database.

Note: The Statistics Logger session agent uses the `TLUSER` account to connect to the `TL_STATISTICS` database. This database user account must have read/write privileges on the database. See "SQL Server Administration" in the *IBM Tealeaf Databases Guide*.

The results of these assembled statistics logs can be reviewed in charts and reports through the Tealeaf Portal.

- To see component statistics, select **Tealeaf** > **System Statistics** in the Tealeaf Portal. Select the Tealeaf components. Select date, time, components, and the report to generate. See "System Statistics" in the *IBM Tealeaf cxImpact Administration Manual*.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

Note: During installation, the Tealeaf installer prompts you for server information and whether to enable Stats Logger. If you enabled it during installation, you should not have to change any settings. It is recommended that you accept the default values.

The following configuration settings are available for the session agent:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 31. Statistics Logger Session Agent

Display Name	Name	Description
Log File	LogFile	The log file for the session agent, relative to the Tealeaf install directory. The default value is managed\StatsDebug.log.
Log Level	LogLevel	The logging level for log messages. Accepted values are the following: • Error - reports Errors only • Warning - reports Errors and Warnings • Info - reports Errors, Warnings, and Info messages (default value) • Trace - reports above messages, plus additional information for tracing • Debug - reports maximum information **Note:** The Debug logging level should only be enabled when you are debugging issues. When you have finished debugging, remember to reset the logging level.
Pass Through	PassThrough	When set to YES, the statistics logging application is not the final destination for hits in the pipeline. Instead of dropping statistics hits, the DownStreamConfigSection can be used to define additional session agents, including Canister session agent or other destinations, where non-visitor hit data is stored. The default value is NO.
SQL Retry Interval	SQLRetryTimeMins	The time interval to try to restore a lost SQL connection. The minimum accepted time is 1 minute, and there is no upper limit. The default value is 5.

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Tealeaf Reference Session Agent

The Tealeaf Reference session agent is deployed in the Windows pipeline to detect specific dimensional data and capture it for use by Tealeaf.

The Reference session agent can be used for these activities:

- User-agent detection - The Tealeaf Reference session agent can detect the type of user agent, browser, and operating system in use by your visitors. For more information, “Extended User Agent Parsing” on page 343.
- Referrer parsing and prepending - The Tealeaf Reference session agent can be configured to normalize referrer values into name-value pairs for easier analysis and can prepend these values with a configured string to eliminate potential conflicts with other URL values. See “Referrer Parsing” on page 342.
- Client-side capture references - The Tealeaf UI Capture capability can be deployed to capture client-side events and other data, including reference values. These values are detected by the Tealeaf Reference session agent. See “Client-Side Capture References” on page 340.

For some deployments of the Processing Server, this session agent is included in the default pipeline and is required. See "CX Pipeline Configuration" in the *IBM Tealeaf CX Configuration Manual*.

Tutorial

For more information about how user agent information is used within Tealeaf, including steps to configure event objects to track user agent information, see "E2E Scenario - Tracking User Agent Information".

"E2E Scenario - Tracking User Agent Information in Tealeaf" is in the *IBM Tealeaf cxImpact User Manual*.

Add the session agent

Session agents can be added through the Pipeline Editor in TMS. This session agent is added to the default pipeline on each Canister. The session agent must be present in any pipeline that processes session hits.

See "Adding a Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

For more information about the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The configuration options are changed with the `TealeafCaptureSocket.cfg` file that is stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Client-Side Capture References:

Tealeaf Reference session agent adds `TLT_CUI_URL` and `TLT_CUI_APPLICATION_NAME` values to the request buffer to track the URLs and application names from which events captured from the client user interface are generated.

These values are generated when the IBM TealeafCX UI Capture for AJAX is licensed and deployed in your environment to capture user interface events occurring in the visitor's browser. For more information, please contact your IBM Tealeaf representative. For more information on IBM TealeafCX UI Capture for AJAX, see "UI Capture FAQ" in the *IBM Tealeaf UI Capture for AJAX FAQ*.

These values are generated like normal reference values, but they might not match the values in the normal members. The normal members represent the parent page from which the AJAX client-side events were started. Since the child event might post to any page, its value might not match the parent page.

- `TLT_CUI_URL` is rendered as the normalized value for the client-side URL.
- If the session agent is configured for overloading the application field, `TLT_CUI_APPLICATION_NAME` might be used in a different way. See “Overloading and UI Capture” on page 352.

Tealeaf Reference session agent also adds `TLT_CUI_URL_ID` and `TLT_CUI_APPLICATION_NAME_ID` values to the request buffer, which allows coupling of data from AJAX requests and the parent pages from which they are started. They follow the same scheme as the regular TLT IDs. All of their information comes from the same reference files, and they can be manipulated and augmented in the same way.

Path reference values

The hardest dimension to make meaningful is the Path dimension, which contains URL information. Dynamic content generation technologies can serve differing page content in response to requests for a path. Thus, URLs might differ only in their query string, POST data, or other HTTP request content.

Determine path values:

The value of the Path reference dimension can be set by the Tealeaf Reference session agent or by any pipeline agent before it. The session agent provides the following three methods for setting this variable: Simple, Mapping, and Programming.

The *path* is defined as all characters in the URL from the first / after the host identifier through the character that precedes the first ?, if it is present. The following elements are not part of the path:

- Protocol identifier: `http://`
- Host: (for example, `www.tealeaf.com`)
- Port (for example, `:80`)

Simple

In the Simple case, the file name extension and HTTP status code checks done by Tealeaf Reference session agent are sufficient to limit or determine the virtual path values. This case implies the following conditions:

- The URL does not contain distinct session or hit identifiers. It does not carry any state information.
- Paths end with file name extensions
- The website software is homogeneous across all servers. Default page names (for example, `index.html` or `default.asp`) for URLs that end with / are identical for all web servers.

Mapping

The mapping technique can be used for the following cases:

- The path for multiple pages can be the same (for example, `/page.cgi` or `/ISAPI.dll`), but one or two query strings or other request variables can distinguish pages from one another.
  - For example, a code can be embedded in the query string to distinguish pages for the web application's own purposes, as in the catid value `700` in `/page.asp?catid=700` signifies the Product View page).
  - The session agent's "default page" algorithm for virtual directories (for example, `URL=/` or `URL=/somedir/`) use the mapping configuration file to set the TLT_URL value.
  - The mapping file has an initial entry that is created during the installation process. For example:

    ```
    # TLT_URL URL ReqVar1 ReqVar2
    /default.asp /
    ```

    This example configuration assigns `TLT_URL=/default.asp` in the `[appdata]` section when / is the value of the URL variable in the Tealeaf request.
- Virtual directory start patterns determine validity of paths. All paths that conform to a specified start pattern are included, such as all paths that begin with `/server/` or `/support/customers/`).

This method is more open-ended than the first mapping method and allows more junk path values to be accepted.

Programming

Programming, in the form of RTA rules or a custom pipeline agent, using TCL or Managed Code session agents, is required for cases that cannot be handled by the Simple or Mapping techniques. For example, if the URL value contains any type of application state or tracking information that should be stripped out to produce a good value for `TLT_URL`, the `TLT_URL` value must be set through a custom pipeline agent upstream of Tealeaf Reference session agent.

As performed by DoubleClick or Coremetrics® for example, page tagging cannot be handled natively by the session agent as a source for the value of TLT_URL. You must create a custom pipeline agent and apply it before the session agent.

Order of precedence of Path processing methods

The URL processing precedence is as follows:

- URLReferenceRules
- URLReferenceVirtualDir
- NormalizeURLExt and NormalizeURLStatusCode

If URLReferenceRulesMode is set to STOP, then method 3 is not used to validate the URL, and Tealeaf Reference session agent performs strict interpretation of the URL.

- If the mode is CONT, then a combination of rules and status code and file name extension tests can be used.

An example of combining methods 1 and 3 would be for a site with multiple possible virtual directory names, most likely because the web servers are a heterogeneous mixture of IIS and Java™ Platform, Enterprise Edition. Use step 1 to determine the default file name for virtual directories. For all other types of URLs, use the normal extension/status code rules.

Example:

```
#TLT_URL URL ReqVar1 ReqVar2
/default.asp / IISSESSIONID
/page.jhtml / JSESSIONID
```

High-volume dimensions:

Path values are used to populate the URL dimension that is provided by Tealeaf. Depending on how this dimension is configured, your database can grow without limit.

Data management of dimensions is especially important for dimensions that capture a high volume of values, such as URL. Implementation of specific instructions for managing URL and other high-volume dimensions can help to prevent runaway database growth.

- See "Managing URL and Other High-Volume Dimensions" in the *IBM Tealeaf Event Manager Manual*.

More reference parsing options

The Tealeaf Reference session agent can parse the HTTP_REFERER value in the REQ buffer into a more accessible set of name-value pairs. The Tealeaf Reference session agent manages the detection and population of user agent information that is extracted from the request buffer.

Referrer Parsing:

The Tealeaf Reference session agent can parse the HTTP_REFERER value in the REQ buffer into a more accessible set of name-value pairs.

Consider the following example name-value pair:

```
HTTP_REFERER=[http://www.yourdomain.com/parent/first_child/second_child/
              page.html?id=1234&req=25&page_id=2]
```

The [referrer] section in the REQ buffer looks like this:

```
[referrer]
REFERRER_DOMAIN=yourdomain.com
REFERRER_FILEPATH=/parent/first_child/second_child/page.html
req=25
page_id=2
id=1234
```

This configuration allows Tealeaf to generate events on and collect data for values within certain referring URLs of your choosing.

- First Hit: The referrer parsed from the first hit of a session is used as input for the session attribute that tracks referrer values. This value is the referrer for the session.
- Each Hit: Tealeaf Reference session agent also detects the referrer value for each hit in the session.

To enable referrer parsing in Tealeaf Reference session agent, set ReferrerParsing=True in the session agent configuration through TMS.

If ReferrerParsing is not enabled, the pattern Referrer Domain provided by Tealeaf does not capture any data.

Referrer prepending:

To eliminate potential conflicts between referrers and URL fields, you can prepend values in the referrer section.

For example, add this configuration property to the Tealeaf Reference Session Agent configuration:

```
ReferrerPrepend=MY_PREPEND_
```

To prepend referrers, Referrer Parsing must be enabled (ReferrerParsing=True).

When referring prepending is enabled, the sample output in the [Referrer] section of the request:

```
[Referrer]
MY_PREPEND_REFERRER_DOMAIN=somewhere.somplace.com
MY_PREPEND_REFERRER_FILEPATH=/testytime/testytime2/file.dll
```

Extended User Agent Parsing:

The Tealeaf Reference session agent manages the detection and population of user agent information that is extracted from the request buffer. When a user submits a request to the web application, information about the visitor's browser, operating system, and type of application (mobile, desktop, BOT) is included in the request.

The information in the request is compared to a set of publicly maintained standards and overrides that you define to determine if the submitted user agent information matches known user agents.

- Initially, the Tealeaf Reference session agent examines a self-pruning cache that it maintains in memory for faster access to the mostly commonly detected values. See “Tune the self-pruning cache” on page 347.
- If no match is found, the session agent examines other file-based resources for matches. See “Order of evaluation for extended user agent parsing” on page 344.

Note: By default, user agent parsing is enabled for new installs and upgrades. Legacy Mode must be enabled separately. See "Legacy Mode for user agent parsing" on page 351.

Example output:

This example shows the output for a name-value pair in a request.

Suppose this user agent name-value pair is detected in the request:

```
HTTP_USER_AGENT=Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.9.2.13)
                Gecko/20101203 Firefox/3.6.13 ( .NET CLR 3.5.30729)
```

When the user agent is detected, the session agent performs lookups to return the values that are associated with this user agent from the public standards. These values are inserted as name-value pairs in the request:

```
[ExtendedUserAgent]
TLT_BROWSER=Firefox
TLT_BROWSER_VERSION=Firefox3.6
TLT_BROWSER_PLATFORM=Win XP
TLT_TRAFFIC_TYPE=BROWSER
TLT_BROWSER_JAVASCRIPT=true
TLT_BROWSER_COOKIES=true
```

If `TLT_TRAFFIC_TYPE=MOBILE`, then these fields can be inserted and populated for the mobile user agent:

```
TLT_SCREEN_HEIGHT
TLT_SCREEN_WIDTH
TLT_COLOR_DEPTH
TLT_PICTURE_SUPPORT
TLT_VIDEO_SUPPORT
TLT_STREAMING_SUPPORT
```

Additionally, if user agent logging is enabled, these entries can appear in the `[UALog]` section that is inserted into the request:

```
[UALog]
Retrieve From Cache took 9.029e-005 seconds
Checking TLT_USER_CAP
Selected class User Agent Parsing::Firefox User Agent Matcher
User Agent Parsing::Wurfl Data Manager::Apply Exact Match
m_user Agent Map.find took 0.000342962 seconds
User Agent Parsing::Wurfl Data Manager::Apply Exact Match
   took 0.000636579 seconds
User Agent Parsing::Browscap Data Manager::Apply Exact Match
m_exact Search Map.find took 0.000381108 seconds
Regex match: Mozilla/5\.0\s+\(Windows;\s+.*;\s+Windows\s+NT\
   s+5\.1;\s+.*;\s+rv:1\.9\.2.*\)
   \s+Gecko/.*\s+Firefox/3\.6.*
m_regex Search Map lookup took 0.00878997 seconds
User Agent Parsing::Browscap Data Manager::Apply Exact Match
   took 0.00971492 seconds
User Agent Parsing::Filter::Get Data Node took 0.0113107 seconds

GJK_Browscap_Version GJK_Browscap_Version
4566 Thu, 28 Oct 2010 19:52:36 -0000
```

Order of evaluation for extended user agent parsing:

When the Tealeaf Reference session agent detects a value in the `HTTP_USER_AGENT` request variable, the value is evaluated through a several step process.

The value evaluation steps are:

Table 32. Order of evaluation for extended user agent parsing

Order of Evaluation	File name	Description
1	special non-valid values	If the `HTTP_USER_AGENT` contains blank or white space values, special values are inserted into the appropriate attributes. See "Blank user agent values" on page 346.
2	in-memory cache	Check for the value is made to the in-memory cache maintained by the session agent. See "Tune the self-pruning cache" on page 347.
3	`UserCap.csv`	User-defined values that override any values in the public standards (`WURFL.csv` and `BrowsCap.csv`) are specified in this file, which is checked before the public standards. • `UserCap.csv` may be used to insert values that are not present in the public standards. • These matches are identified using the UAMatchers DLLs. See "UAMatchers" on page 349.
4	`WURFL.csv`	Public standard for mobile devices. This file must be downloaded and converted from its native XML for use by the session agent. • During conversion, you may optionally include the use of generic values in your converted WURFL file. See "Use of generics" on page 347. • These matches are identified using the UAMatchers DLLs. See "UAMatchers" on page 349. • See "User Agent Tools" in the *IBM Tealeaf cxImpact Administration Manual*.
5	mobile native application	For mobile native applications monitored by Tealeaf, user agent information is automatically submitted by the Tealeaf client framework that is monitoring the application. This information is used to populate the standard extended user agent parsing properties. See "Extended user agent parsing for mobile native applications" on page 350.

Table 32. Order of evaluation for extended user agent parsing (continued)

Order of Evaluation	File name	Description
6	BrowsCap.csv	Public standard for fixed and bot user agents. This file must be converted from its native format for use by the session agent. • Generics are automatically included in the converted version of BrowsCap.csv. See "Use of generics" on page 347. • See "User Agent Tools" in the *IBM Tealeaf cxImpact Administration Manual*.
7	UserSupplement.csv	If no match is found in any of the above files, the session agent checks the UserSupplement.csv, which can be used to add user agents that are not currently listed in the public standard and are appearing in your capture stream.

Blank user agent values

If the value of HTTP_USER_AGENT is a value that cannot be detected, then these values are inserted into the relevant attributes:

Table 33. BrowserType hit attribute:

Detected Value	Attribute	Inserted Value
""	BrowserType	UserAgentBlank
whitespace	BrowserType	UserAgentBlank
HTTP_USER_AGENT not found in request	BrowserType	UserAgentNotFound

Table 34. TrafficType hit attribute:

Detected Value	Attribute	Inserted Value
""	TrafficType	UserAgentHeaderIsBlank
whitespace	TrafficType	UserAgentBlank
HTTP_USER_AGENT not found in request	TrafficType	NoUserAgentHeaderFound

To search for TrafficType values:

- **Active sessions:** Search the Text in Request for TLT_TRAFFIC_TYPE=<Inserted Value>.
- **Completed sessions:**
  - Create an event to record the value of the Traffic Type hit attribute. See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.
  - Create a privacy rule to move the TLT_TRAFFIC_TYPE request variable and value to the [appdata] section. See "Privacy Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

For more information about search, see "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.

Tune the self-pruning cache:

Depending on the traffic volume and the variety of traffic to your website, you might need to tweak the settings for the self-pruning cache. Finding an appropriate setting for these two parameters is paramount for optimum performance of your pipeline when you are using extended user agent parsing.

Pruning interval

You can define the interval at which the self-pruning cache is updated to reflect the most recently detected user agents. The `PruningInterval` setting is the number of seconds between updates.

- Adjust the setting after extended user agent parsing is in operation.

By changing the `PruningInterval` value of the cache, you are affecting how likely it is that a user agent is removed from the cache due to inactivity. When this value is large, a user agent can be in the cache for a long time before it is removed. When it is small, the user agent must be seen frequently, or it is more likely to be removed.

Maximum cache size

The `MaxCacheSize` setting is the maximum number of entries in the cache.

- Adjust the setting after extended user agent parsing is in operation.

For websites with a core set of user agents, the cache performs well with a relatively small MaxCacheSize setting. Set this value to `2000`. This value size effectively means that up to 2000 different user agents are stored for quick lookup.

- If you begin to see spooling due to the user agent cache, increasing the `MaxCacheSize` value decreases the likelihood that an incoming user agent string is not already cached. Increasing this number also use more memory, as more data must be stored.

Use of generics:

The public standards that are used for extended user agent parsing can contain generic values for user agents.

For example, if a user agent string of `iPhone 10` is detected in the capture stream and there is no exact match in the public standard, a generic user agent string (`iPhone`) can be inserted, if the public standard contains a generic entry.

- `BrowsCap.csv` - For fixed user agents, use of generics is automatically enabled and cannot be configured.
- `WURFL.csv` - For mobile user agents, use of generics is enabled by default when the public standard is converted for use in Tealeaf. See "User Agent Tools" in the *IBM Tealeaf cxImpact Administration Manual*.

Enabling generics is useful for capturing in some form new versions of user agents that are not yet in the public standards. When the public standards are updated, the entries for these user agents match on the public standard without configuration changes. See “Order of evaluation for extended user agent parsing” on page 344.

Specifying paths to skip:

Optionally, you can configure extended user agent parsing to treat specified URLs that are triggered by specific user agents to be marked as a different traffic type. Complete this task to specify the paths to skip.

For example, suppose that for the user agent `Jakarta`, a visit to any page other than `/MyXMLService.aspx` indicates that the user agent is a search engine while visits to `/MyXMLService.aspx` indicate that the user agent is not a robot. By defining this path to be skipped during normal user agent parsing, you can specify the appropriate traffic type value for the non-robot exception (`TrafficType=XMLServiceConsumer`).

1. Log in to the Tealeaf Portal as an administrator.
2. From the **Portal** menu, select **Tealeaf** > **TMS**. The Tealeaf Management System is displayed. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Click the **WorldView** tab.
4. From the Servers drop-down, select the server hosting the capture pipeline where the Tealeaf Reference session agent is deployed.
5. Click the **Transport Service** node.
6. Select **Transport Service configuration**.
7. In the Config Actions tab, click **View/Edit (Raw)**.
8. The raw version of the `TealeafCaptureSocket.cfg` file is displayed. You can choose to copy and paste this content into your favorite text editor for editing.
9. In the file, locate the `[TLTRef]` section.
10. Look for the following configuration settings in the `[TLTRef]` section. If they are not present, insert them.

    ```
    PathsToSkip=^MyPath*$;^YourPath*$
    TrafficTypeForSkippedPaths=XMLService
    BrowserForSkippedPaths=XMLServiceConsumer
    ```

    where

    Setting Description

    `PathsToSkip`
    Enter a list of paths, delimited by semi-colons (`;`). You can enter regular expressions. For example, you can enter a value of `^MyPath*$` to match all paths that contain the substring `MyPath`. For more information about regular expressions, see “Regular expressions in extended user agent parsing” on page 349.

    `TrafficTypeForSkippedPaths`
    For paths that match a value that is specified in `PathsToSkip`, this setting identifies the value to insert into the `Traffic Type` object. See "Configuring User Agent Events" in the *IBM Tealeaf cxImpact Administration Manual*.

    `BrowserForSkippedPaths`
    For paths that match a value that is specified in `PathsToSkip`, this setting identifies the value to insert into the `Browser Type` object. See "Configuring User Agent Events" in the *IBM Tealeaf cxImpact Administration Manual*.
11. To save your changes, click **Save**.
12. To push the change to other Canisters in your environment, click **Add Tasks and Submit**.

Regular expressions in extended user agent parsing:

You can use regular expressions in the values you define in user agent parsing configuration.

This table lists exceptions to the standard implementation of regular expressions:

Character	How Used
*	Wildcard
?	Wildcard
.	String literal. Appears frequently in user agent definitions.
(	String literal. Appears frequently in user agent definitions.
)	String literal. Appears frequently in user agent definitions.
Space character	Treated as white space.

Because of these exceptions and some other differences, the implementation of regular expressions for this session agent and the IBM Tealeaf CX RealiTea Viewer are not the same. See "Regular Expressions in the RealiTea Viewer" in the *IBM Tealeaf RealiTea Viewer User Manual*.

This table shows some examples and how they match values in user agent parsing.

RegEx pattern	Matches
^IP$	IP SHIP SHIPS
S.P	SP SIP SIT UP
S?P	SIP SAP SOP
S*P	SIP SAP STOP

UAMatchers:

Matching between detected values and the available set of user agent values is managed by plug-in. For each major type of user agent, Tealeaf provides a separate `.dll` that performs the matching analysis. UAMatchers plug-ins are provided by Tealeaf. Customers cannot create their own plug-ins now.

When user agent data is not available in the public standard definition files, a UA Matcher can augment the user agent information that is recorded in the session with additional information. The additional information includes browser version or browser platform, that are read directly from the user agent string that is provided in the original request.

- Currently, the Browscap standard does not distinguish between the WinXP 64-bit platform and the Windows Server 2003 64-bit platform, as user agent strings

from both platforms self-identify as `Windows NT 5.2`. By default, Browscap identifies this user agent string as a WindowsXP 64-bit machine.

UAMatchers are stored in this directory:

```
<Tealeaf_install_directory>\System\UAMatchers
```

Do not move, rename, or otherwise modify these files.

Extended user agent parsing for mobile native applications: Individual mobile applications typically send a unique user agent string that is not known to any public repository, or they may not send a user agent at all. As a result, user agent detection for mobile native applications cannot rely on WURFL, Browscap, or other public standard.

To enable tracking of user agent-related information, the Tealeaf client frameworks for mobile native applications submitthis header information:

Table 35. Mobile native applications header information

Logging Framework	Example Submitted Header
Android Logging Framework	`HTTP_X_TEALEAF=device (Android) Lib/0.0.10`
iOS Logging Framework	`HTTP_X_TEALEAF=device (iOS) Lib/8.5.4.1`

The header is also used by the IBM Tealeaf CX UI Capture for AJAX solution. However, user agent detection for IBM Tealeaf CX UI Capture for AJAX is sourced from the client being used in the session. See "Client-Side Capture References" on page 340.

When the Tealeaf Reference session agent detects the `HTTP_X_TEALEAF` header and either the `(android)` or `(ios)` value, it performs these tasks:

- Tealeaf Reference session agent overwrites the request variable for traffic type:

  ```
  TLT_TRAFFIC_TYPE=MOBILE_APP
  ```

  – This value is eventually surfaced as the value `MOBILE_APP` in the `Traffic Type` dimension. See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.
- Tealeaf Reference session agent overwrites the request variable for browser platform:
  – Android:

    ```
    TLT_BROWSER_PLATFORM=Android
    ```

  – iOS:

    ```
    TLT_BROWSER_PLATFORM=iOS
    ```
- Tealeaf Reference session agent looks for the `HTTP_X_TEALEAF_PROPERTY` header, which is submitted from the client frameworks with extended user agent information. For example:

  ```
  HTTP_X_TEALEAF_PROPERTY=TLT_BROWSER=StraussAndPlesser Native;
  TLT_BROWSER_VERSION=8.5; TLT_BROWSER_PLATFORM=Android;
  TLT_BRAND=Asus; TLT_MODEL=Asus Eee Pad Transformer TF101;
  TLT_SCREEN_HEIGHT=800; TLT_SCREEN_WIDTH=1280;
  TLT_COLOR_DEPTH=65536
  ```
- These values are used to populate the `[ExtendedUserAgent]` section. For example:

  ```
  [ExtendedUserAgent]
  TLT_BROWSER=StraussAndPlesser Native
  TLT_BROWSER_VERSION=8.5
  ```

```
TLT_BROWSER_PLATFORM=Android
TLT_BRAND=Asus
TLT_MODEL=Asus Eee Pad Transformer TF101
TLT_SCREEN_HEIGHT=800
TLT_SCREEN_WIDTH=1280
TLT_COLOR_DEPTH=65536
```

These [ExtendedUserAgent] fields are not populated with data from the mobile native applications, as the fields are applicable to browsers only:

```
TLT_BROWSER_JAVASCRIPT
TLT_BROWSER_COOKIES
TLT_PICTURE_SUPPORT
TLT_VIDEO_SUPPORT
TLT_STREAMING_SUPPORT
```

Some of the above variables may be inserted with false values if the request itself includes a user agent. After these fields were inserted into the [ExtendedUserAgent] section, the fields and properties of HTTP_X_TEALEAF_PROPERTY are applied.

Legacy Mode for user agent parsing:

In Release 7.2.12.729x, Tealeaf introduced a new implementation of user agent parsing that provides much more accurate matching of user agents that are detected in the capture stream. If you want, you can enable the previous implementation of user agent parsing as a Legacy Mode.

Tealeaf strongly recommends that you use the most recent implementation of user agent parsing. Legacy Mode user agent parsing is provided for customers who upgrade from versions that supported the previous implementation of user agent parsing yet cannot switch to the new implementation now. In a future release, Legacy Mode user agent parsing is likely to be deprecated.

For more information on Legacy Mode, see "Tealeaf Reference Session Agent - Legacy Mode" in the *IBM Tealeaf CX Configuration Manual*.

Overloading application reference field:

As of Release 8.0, the ability to capture the type of user agent is better handled by creating a dimension that is populated by a pattern that detects the value directly from the request. You disable this feature if it was enabled and design a dimension to capture the content. In a future release, this capability is likely to be deprecated.

See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.

Optionally, you can configure the Tealeaf Reference session agent to replace the default contents that are inserted in the TLT_APPLICATION_NAME field of the [appdata] section of the request.

When the OverloadAppRef option is set to True, then the value of TLT_APPLICATION_NAME is overridden with the value for the traffic type that is extracted from the user agent cache. Possible values are as follows:

- BOT
- MOBILE
- BROWSER
- MOBILE_BOT

- UNKNOWN

When the Application reference field is overloaded, the only identifiers visible to the Canister are any associated with the traffic type values.

1. Optional: If you are configuring with the TealeafCaptureSocket.cfg file, in the [TLTRef] of TealeafCaptureSocket.cfg, set OverloadAppRef=true.
2. If you are configuring through TMS:
   a. Add the session agent to your pipeline through the Pipeline Editor. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
   b. Select the **TLTRef session agent** icon in the Pipeline Editor and select **Edit**.
   c. Select **Add Config Items**.
   d. Select the Overload Application Reference Field check box.
   e. Select **OK** twice.
   f. Select **Save**.
   g. Configure a task to update all servers immediately.

Overloading and UI Capture:

If UI Capture is deployed when the **Application reference** field is overloaded, then the value of TLT_APPLICATION_NAME extracted from user agent information is also written to the TLT_CUI_APPLICATION_NAME value, which is inserted by the session agent when the HTTP_X_TEALEAF_PAGE_URL is detected in the request.

HTTP_X_TEALEAF_PAGE_URL is inserted by UI Capture. See "UI Capture FAQ" in the *IBM Tealeaf UI Capture for Ajax FAQ*.

By default, this value contains the URL path of the parent page. For more information about configuring this header, see "UI Capture for Ajax Reference" in the *IBM Tealeaf UI Capture for Ajax Guide*.

In the table below, you can review the mapping of destination request variables and how they are populated by data when overloading is disabled and enabled.

Table 36. Overloading and UI Capture

Destination Request Variable	Standard Request Source	Overloaded Request Source
TLT_CUI_APPLICATION_NAME	HTTP_X_TEALEAF_PAGE_URL header	If overloaded: TLT_TRAFFIC_TYPE
TLT_APPLICATION_NAME	[env]/URL	If overloaded: TLT_TRAFFIC_TYPE

Both application variables in the request contain the traffic type information that is extracted for the detected user agent.

The value for TLT_CUI_URL is set by the session agent and is not affected by overloading the application field. See “Client-Side Capture References” on page 340.

Configuration settings

Several configuration settings are available for the Tealeaf Reference session agent.

Display Name values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Name values are displayed in TealeafCaptureSocket.cfg.

This table lists and describes the configuration settings:

Table 37. Configuration Settings

Display Name	Name	Description
Advanced User Agent Parsing	AdvancedUAParsing	When set to True, the Tealeaf Reference session agent uses the self-pruning cache to speed up lookups of user agent information. This cache contains the most recently seen user agents. The default value is True. See "Configuring User Agent Detection" in the *IBM Tealeaf cxImpact Administration Manual*.
Allow Empty Extensions	AllowEmptyExtension	When True, URLs that do not contain an extension are permitted to be normalized. The default value is True.
Days to Keep Stats	StatsKeepDays	The number of days to retain statistics on the Tealeaf Reference session agent in rolling log files. The default value is 30.
Log Reference Statistics	OutputReferenceStats	When set to True, statistics on the Tealeaf Reference session agent operations are generated each hour for reporting through the Statistics Logger session agent. The default value is True.
Maximum Cache Size	MaxCacheSize	The maximum number of entries in the cache. The default value is 2000. **Note:** If Advanced User Agent Parsing is enabled, this value must be specified.
Normalize App Name	NormalizeAppName	When set to True, the value of TLT_APPLICATION_NAME is set to the virtual directory defined as the value between the first two slashes of the URL. The default value is True.
Normalize Host	NormalizeHost	When set to True, extra data manipulation is performed to normalize host values before they are saved as reference IDs. The default value is True.
Normalize Server	NormalizeServer	When set to True, TLT_SERVER is set to the value of LOCAL_ADDR. The default value is True.

Table 37. Configuration Settings (continued)

Display Name	Name	Description
Normalize URL	NormalizeURL	Only URLs with the extension and status codes that are listed under NormalizeURLExt are considered. • If the URL ends in a slash, the default root is appended, and the URL is decoded. • If the URL contains one of the characters (/, :, ;, ?), the URL is truncated at that character. • The default value is True.
Pruning Interval	PruningInterval	The interval in minutes when the user agent cache is updated with the most recently seen user agents. The default value is 10. **Note:** If Advanced User Agent Parsing is enabled, this value must be specified.
Reference Statistics Min Hits	OutputReferenceStatsMin	Minimum number of hits during a statistic log interval to qualify the reference statistics for logging. The default value is 1.
Reference Update Interval	UpdateInterval	Interval in seconds at which the references files are updated or read. The default value is 60.
Referrer Parsing	ReferrerParsing	When set to True, referrer values are parsed and normalized. The default value is True. See "Referrer Parsing" on page 342.
Statistics Reporting Interval	StatsReportingInterval	The interval in minutes at which the session agent reports statistics. The following values are accepted: 5, 10, 15, 30, or 60. **Note:** This interval is relative to the start of the hour. For example, a value of 30 generates statistics at 12:00, 12:30, and so on.
Status Codes	NormalizeURLStatusCode	The list of qualifying URL status codes that can be normalized. The default value is 0;200;302;304;400;402;403;404;410;500;501;502;503;504;505.
URL Default Document	NormalizeURLRootDefault	If the URL indicates that the resource is a directory, then this value is inserted as the default file name. The default value is DEFAULTPAGE.
URL Extensions	NormalizeURLExt	The semi-colon delimited list of URLs to be normalized. The default value is ACTION;ASMX;ASP;ASPX;CSS;DO;HTM;HTML;GIF;ICO;JPG;JS;JSP;JHTML;PDF;PHP;SWF.
URL Reference Rules	URLReferenceRules	Whether URL reference rules are enabled. The default value is true.

Table 37. Configuration Settings (continued)

Display Name	Name	Description
URL Reference Rules File	URLReferenceRulesFile	The path and file name of the URL reference rules. The default value is .\system\Reference_Path_Rules.txt. • Relative paths are relative to the directory that contains the DLL in use.
URL Reference Rules Mode	URLReferenceRulesMode	The mode for URL reference rules. The default value is cont. • stop - URL processing ends after the rule set or virtual directory fails to match. Processing always stops after a matched rule set or virtual directory. • cont - URL processing continues even if a failure condition is met.
Use Full Virtual Dir	UseFullVirtualDir	If set to True, matches are made for the entire virtual directory string, even if it includes a slash (for example, myapp\subdir). If set to False, matches are determined by the URLReferenceVirtualDir setting in use. The default value is False. • See "Reference virtual directories" on page 356.
URL Virtual Dirs	URLReferenceVirtualDir	A list of URL virtual directories, which are separated by commas and without spaces. The default value is servlets. Example: servlets;cgi-bin • Other options are available. See "Reference virtual directories" on page 356.
User Agent Files Directory	UAFilesDir	This directory contains all required user agent parsing files: • BrowsCap.csv for desktop user agent detection • WURFL.csv for mobile user agents • UserCap.csv for any user-defined user agent detection strings **Note:** – If Advanced User Agent Parsing is enabled, this value must be specified. – This value is a full path to the directory. Do not use a relative path. – You can specify this path as a UNC path. • See "Configuring User Agent Detection" in the *IBM Tealeaf cxImpact Administration Manual*.

This table lists and describes more configuration items:

Table 38. More Configuration Items:

Display Name	Name	Description
Log URL Statistics	OutputURLStats	This debugging tool can be used to output URL statistics. The default value is False.
Overload Application Reference Field	OverloadAppRef	When set to True, the value of TLT_APPLICATION_NAME in the request buffer is overridden by the value for the type of browser that is extracted from the user agent cache. See "Overloading application reference field" on page 351.

Reference virtual directories:

You can specify all or specific parts of the URL to use as the virtual directory.

To use the entire URL, set UseFullVirtualDir to True.

To use part of the URL, set UseFullVirtualDir to True. You can determine the part of the URL to use as the virtual directory by setting one of the following parameters to True.

Suppose that this URL is encountered:
/dir/sub-dir/sub-sub-dir/page.html

- If URLReferenceVirtualDir=true, then the virtual directory is:
  dir
- If URLReferenceVirtualDir2=true, then the virtual directory is:
  sub-dir
- If URLReferenceVirtualDir3=true, then the virtual directory is:
  sub-sub-dir

Any setting for URLReferenceVirtualDir4 and above is ignored.

Tealeaf reference session agent in multi-canister environments

The session agent should be deployed in a consistent location in each Windows pipeline of each Canister that is processing hits. In a multi-canister environment, all canisters can communicate independently with the database to retrieve reference values.

Tealeaf session agents

- "Adding a Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Archive Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Canister Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Cookie Parser Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Data Drop Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Data Parser Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Decouple Session Agent" in the *IBM Tealeaf CX Configuration Manual*

- "Extended Decoupler Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Extended Privacy Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Health-Based Routing (HBR) Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Inflate Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "JSON Mobile Parser Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Managed Code Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Null Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Privacy Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Real-Time Monitoring and Alert (RTA) Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Response Tags to Request Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "RTA Split Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Sessioning Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Session Router Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Socket Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Statistics Logger Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- Tealeaf Reference Session Agent
- "Tealeaf Sessioning Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "TimeGrades Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "TLI Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "URL Decode Session Agent" in the *IBM Tealeaf CX Configuration Manual*

Tealeaf Reference Session Agent - Legacy Mode

Note: This section describes a legacy mode for user agent parsing. For Release 8.1, Tealeaf utilizes a superior implementation for tracking fixed, mobile, and bot user agents. Tealeaf strongly recommends using the new method of user agent parsing. See "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

The Tealeaf Reference session agent manages the detection and population of user agent information extracted from the request buffer. When a user submits a request to the web application, information about the visitor's browser, operating system, and type of application (mobile, desktop, BOT) is included in the request.

Note: By default, user agent parsing is enabled for new installs and upgrades. Legacy Mode must be enabled separately. See “Enabling Legacy Mode” on page 358.

Overview

Legacy Mode enables the capabilities of the initial implementation of extended user agent parsing.

Note: With respect to Tealeaf users, the difference between the two implementation methods is seamless. However, the newer method provides superior matching capabilities, logging improvements, and better support for data anomalies.

Legacy Mode features include:

- Use of a self-pruning cache for quick access to the most frequently detected user agents. This cache is also used in the new implementation. See "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*.
- Configuration files in use:
  - `BrowsCap.csv` - Public standard for fixed and bot user agents.
  - `UserCap.csv` - User-defined configuration file of user agents not available in `UserCap.csv`.
  - `WURFL.csv` - If the IBM Tealeaf CX Mobile module is licensed, the WURFL standard must be downloaded and converted to CSV format, which contains the public WURFL standard for use by Tealeaf in identifying mobile user agents.
    - See "Maintaining the CX System" in the *IBM Tealeaf CX Installation Manual*.
- Log messages sent to the Windows Event Log.

Enabling Legacy Mode

To enable Legacy Mode user agent parsing, please complete the following steps.

Note: If you have been using the standard version of user agent parsing and have added values into the `UserSupplement.csv` file, those values must be inserted into `UserCap.csv`. `UserSupplement.csv` is not used in Legacy Mode.

1. Login to the Tealeaf Portal as an administrator.
2. From the Portal menu, select **Tealeaf** > **TMS**. The Tealeaf Management System is displayed. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Click the WorldView tab.
4. From the Servers drop-down, select the server hosting the capture pipeline where the Tealeaf Reference session agent is deployed.
5. Click the Transport Service node.
6. Select **Transport Service configuration**.
7. In the Config Actions panel, click **View/Edit (Raw)**.
8. The raw version of the `TealeafCaptureSocket.cfg` file is displayed. You may choose to copy and paste this content into your favorite text editor for editing.
9. In the file, locate the `[TLTRef]` section.
10. Verify that the setting for `AdvancedUAParsing` is `True`. This setting enables basic user agent parsing. It should be set to `True` for all new installs or upgrades to Release 8.1 or later. If it is not, set this value to `True`.
11. Search the `[TLTRef]` section for `UAParsing=`.

    If it is not found, insert the following line in the section:

    ```
    UAParsing=old
    ```

    If it is found, verify that it is set to the above value (`old`). This setting enables Legacy Mode.

    Note: This setting is not available by default and must be inserted in the configuration manually.
12. Configure the other settings for the user agent. See "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*.
13. To save your changes, click **Save**.
14. To push the change to other Canisters in your environment, click **Add Tasks and Submit**.

15. Legacy Mode for user agent parsing is enabled. To disable, set `UAParsing` to any other value, comment out the line, or remove it from the configuration.

Disable use of generics

When Legacy Mode is enabled, use of user agent generics is not supported. See "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

Generics are a substitution mechanism used when updates to `BrowsCap.csv` and `WURFL.csv` are converted for use in Tealeaf. During this conversion process, the use of generics is disabled by checkbox. See "User Agent Tools" in the *IBM Tealeaf cxImpact Administration Manual*.

Tuning the self-pruning cache

Depending on the traffic volume and the variety of traffic to your website, you may need to tweak the settings for the self-pruning cache. Finding an appropriate setting for these two parameters is paramount for optimum performance of your pipeline when using extended user agent parsing.

Legacy Mode utilizes the same cache as the current implementation.

- See "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

Event log messages at startup

Several errors can occur during startup of the extended user agent module. Most of the errors pertain to missing files or files in the wrong format. While the errors are meant to be self-explanatory, you can avoid causing issues with user agent cache files by observing the following rules.

Rules for editing configuration files

1. **Do not** edit the files `BrowsCap.csv` and `WURFL.csv` by hand in an editor. These files are meant to be in the format created by their owners and should not be altered. The user agent cache verifies the file format and headers prior to loading the files and does not load files that have been altered.

   Note: These files should be updated on a regular basis from released versions of the publicly available standard. See "Maintaining the CX System" in the *IBM Tealeaf CX Installation Manual*.
2. When editing the `UserCap.csv` file, observe the format of the file. Configuring this file is an advanced user function and should only be done by savvy users. The format is defined in the first line of the file and consists of a list of columns. The number of columns and their default values are also available in the file. These must match exactly or loading of the file will fail. For more information on editing, see "User Agent Tools" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Editing the `UserCap.csv` file in Excel may cause the quote characters to be removed from each value on a particular line. In this case, the file fails to load. Always save a backup of the file before editing, so you can revert if a formatting error occurs.

Detecting browser and O/S type from user agent information (earliest version)

Note: The information below is only used when advanced user agent parsing is disabled. The information below pertains to an earlier version of user agent tracking and is superseded by the AdvancedUAParsing setting.

It may be useful to detect and report the types of browser and operating system in use by your visitors. To collect this data, the Tealeaf Reference session agent allows user-chosen name/value pairs denoting a regular expression, to be used against the HTTP_USER_AGENT REQ buffer member.

For example, in the configuration file, you can enter the following section:

```
#User Agent Parsing (add new members as desired)
UA_Replace=True
IE_All=MSIE\s\d\.\d
Opera_MajMin=Opera/\d\.\d\d

#Operating System Parsing (add new members as desired)
OS_Replace=True
Windows_XP=Windows\sNT\s5\.1
```

If UA_Replace is set to True, then the regular expression on each name/value pair is applied to the user agent string. If a match is found, the value for the name on the left side is inserted into the [appdata] section as below:

```
[appdata]
TLT_BROWSER=Opera_MajMin
TLT_OS=Windows_XP
```

In this manner, you can group OS and Browser types in any way. For example, you can make all possible regular expression matches for Microsoft Internet Explorer be represented as IE_ALL, or you could split them by major and minor version numbers to get finer granularity, as in the following example:

```
UA_Replace=True
IE_6=MSIE\s6\.\d
IE_7=MSIE\s7\.\d
```

For reference, the TealeafCaptureSocket-base.cfg file contains several common regular expressions.

Tealeaf Sessioning Session Agent

Sessionization can be applied in the Tealeaf pipeline via the TLSessioning session agent. Tealeaf sessionization relies on user data in the REQ buffer to successfully perform its function.

- The Tealeaf session identifier can be specified as something other than an HTTP Cookie, such as a QUERY_STRING parameter.
- TLSessioning supports sessionization involving tables and table lookups.

  Note: When configuring the TLSessioning section in CSS.cfg, place the section after the [CookieParser] section. Otherwise, the session agent does not see the cookie as a REQ name/value pair.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See "Adding a Session Agent" on page 226.

For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

How Tealeaf Sessioning Works

The strength and vulnerability of Tealeaf sessionizing are the hash tables associated with the session tables. SessionIDs are stored in buckets where the SessionID hash determines the bucket in which the SessionID resides. The goal of hashing keys is to distribute SessionIDs equally across the hash buckets. Therefore, it is important that the hash function work well with the specified SessionIDs so that the resulting bucket usage is relatively uniform. A hash function that does not work well can effectively turn into a sequential list.

Note: Hashes vary between Tealeaf environments. What worked well for one website may not work well elsewhere. Determining the appropriate hash typically involves capturing data to determine the best hash value.

Underlying storage provides 65,536 buckets for storing SessionIDs. For a site that creates a new session every second, 86,400 SessionIDs would be stored per day. With a well-distributing hash, on average there would be one or two SessionIDs per bucket. To find any random SessionID, a user extracts the hash from the SessionID, looks in the associated bucket, and performs no more than two lookups before finding the SessionID. If the hash value is not equally distributed, search times become longer, and in the capture pipeline, speed is of the essence.

Typically, sessionization requires storing 10,000 or more SessionIDs into tables. The rate at which these storage and search operations occur directly impacts the rate of sessionization.

Serially searching through the SessionID pool is very slow. Using hash keys, the database hash determines in which bucket a particular SessionID resides. For example, the standard TLTSID is a 32-byte hex-ASCII value. Bytes 5 through 8 of this string is a fairly random number, making it a good hash key for GUIDs because SessionIDs are equally distributed into buckets specified by this substring. The RTA SessPCT operator uses these 4 bytes to perform its function.

No hash performs equally well on all possible data sets. The default hash function may perform poorly with a particular set of keys. The TLSessioning configuration variable allows for specifying varying hash keys.

Example TLSessioning configuration

Below is an example of the TLSessioning section in the `CSS.cfg` file:

```
[TLSessioning]
TypeName=TLSessioning
DLL=SessionAgentRulesEngine.dll
DownStreamConfigSection=<NEXT CONFIG SECTION>
ScriptTrace=OFF
ResponseType=All
EnvironmentScript=EngineEnvironment.tcl
PreProcScript=TLSessioning.PreProc.tcl
ActionScript=TLSessioning.Action.tcl
```

```
MaxSessions=5000
PrimarySessField=SITESERVER=ID
PrimaryLooseStrict=Strict
PrimaryMaxFieldLen=36
```

The following settings are optional:

```
REQFilterTCL=true
PrimarySessFieldMaskOff / PrimarySessFieldMaskTCL
PrimaryHashKeyOff/PrimaryHashKeyTCL
PrimaryAssociateSetCookie=true
PrimaryCaseInsensitive=true
SecondarySessField =JSESSIONID
SecondaryLooseStrict=Strict
SecondaryMaxFieldLen=156
TertiarySessField=USER_ID
TertiaryLooseStrict=Strict
TertiaryMaxFieldLen=36
```

Configuration Settings

The following configuration settings are available for this session agent:

- **Display Name** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **Name** values are displayed in `TealeafCaptureSocket.cfg`.

Table 39. Configuration Settings

Display Name	Name	Description
`Max Sessions`	`MaxSessions`	Specifies the maximum number of concurrent sessions. The default value is `10000`.
`PrimarySessField`	`PrimarySessField`	Primary Sessioning Field. The default value is `JSESSIONID`.
`PrimaryMaxFieldLen`	`PrimaryMaxFieldLen`	Maximum size of `PrimarySessioningField` in characters.
`PrimaryCaseInsensitve`	`PrimaryCaseInsensitve`	When set to `true`, `PrimarySessioningField` is case-insensitive. The default value is `false`.
`PrimarySessFieldMaskOFF`	`PrimarySessFieldMaskOFF`	This field may be used for specifying field offsets for `PrimarySessField`. Offsets are `0`-based.
`PrimaryAssociateSetCookie`	`PrimaryAssociateSetCookie`	For situations in which the sessioning parameter is a cookie value and may get updated, this option instructs the script to search for the next occurrence of the sessioning parameter. If one is found, that value is associated with the TLTSID.
`SecondarySessField`	`SecondarySessField`	Secondary Sessioning Field. The default value is `JSESSIONID`.
`SecondaryMaxFieldLen`	`SecondaryMaxFieldLen`	Maximum size of `SecondarySessioningField` in characters.

Table 39. Configuration Settings (continued)

Display Name	Name	Description
SecondarySessFieldMaskOFF	SecondarySessFieldMaskOFF	This field may be used for specifying field offsets for SecondarySessField. Offsets are 0-based.
SecondaryAssociateSetCookie	SecondaryAssociateSetCookie	For use when SecondarySessioningField is a cookie and changes within the session, via a set-cookie directive.
SecondaryCaseInsensitve	SecondaryCaseInsensitve	When set to true, SecondarySessioningField is case-insensitive. The default value is false.
TertiarySessField	TertiarySessField	Tertiary Sessioning Field. The default value is JSESSIONID.
TertiaryMaxFieldLen	TertiaryMaxFieldLen	Maximum size of TertiarySessioningField in characters.
TertiarySessFieldMaskOFF	TertiarySessFieldMaskOFF	This field may be used for specifying field offsets for TertiarySessField. Offsets are 0-based.
TertiaryAssociateSetCookie	TertiaryAssociateSetCookie	For use when TertiarySessioningField is a cookie and changes within the session, via a set-cookie directive.
TertiaryCaseInsensitve	TertiaryCaseInsensitve	When set to true, TertiarySessioningField is case-insensitive. The default value is false.
ScriptTrace	ScriptTrace	When enabled, script tracing is applied to the session agent actions, which is helpful for debugging. **Note:** ScriptTrace should not be enabled in production environments.

Examples

The following checks the CaptureSource parameter and only takes those captured via the PCAv2:

```
REQFilterTCL=string equal "TealeafPassiveCapture2" [REQBufVal "CaptureSource"]
```

The following is identical to above except that string comparison is case-insensitive:

```
REQFilterTCL=string equal -nocase "TealeafPassiveCapture2"
   [REQBufVal "CaptureSource"]
```

The following tests if the string "test" is contained anywhere in the HTTP_HOST value:

```
REQFilterTCL=string first "test" [REQBufVal "HTTP_HOST"]
```

Note the `string first` operation is always case-sensitive, so there is no `-nocase` parameter.

The following is identical to above except test is case-insensitive:

```
REQFilterTCL=regexp -nocase -- "test" [REQBufVal "HTTP_HOST"]
```

The following tests if the LOCAL_ADDR parameter contains any of these IP addresses: 10.10.10.10, 10.10.10.14, or 10.10.10.18"

```
REQFilterTCL=regexp -- "10.10.10.(10|14|18)" [REQBufVal "LOCAL_ADDR"]
```

Notes

- Do not change the ctc-conf.xml file to remove TLTSID as the cookie to session, even when it is not. If sessionizing on a non-TLTSID value, Passive Capture creates a 32-byte GUID as the TLTSID value, which turns all hits into 1-hit sessions.
  - TLSessioning assumes that the TLTSID contents are a 32-byte GUID (new sessions assume the TLTSID of the first hit), so keep this value as a 32-byte GUID. If the TLTSID cookie is valid because the Tealeaf cookie injector is in use, then this TLSessioning is not necessary, although there is harm in using it as long as TLTSID is specified as the PrimarySessField.
- Any Session Sampling such as performed by the RTA session agent must be **after** the TLSessioning Script, or there is downstream session infidelity.

Session Joining

TLSessioning can be used for basic Session Joining. **Session Joining** is defined as the joining of fragments into a single fragment. For example, the hits below represent two different physical sessions, as determined by TLTSID:

```
Hit 1: TLTSID = C70C0F4F451ED57190F8D5A059A1D071
Hit 2: TLTSID = C70C0F4F451ED57190F8D5A059A1D071
Hit 3: TLTSID = C70C0F4F451ED57190F8D5A059A1D071 User-Key = 20E8AB8F-531D
Hit 4: TLTSID = C70C0F4F451ED57190F8D5A059A1D071 User-Key = 20E8AB8F-531D
Hit 5: TLTSID = 649B0BDA4BC15E0B141AD99791282A13 User-Key = 20E8AB8F-531D
Hit 6: TLTSID = 649B0BDA4BC15E0B141AD99791282A13 User-Key = 20E8AB8F-531D
Hit 7: TLTSID = 649B0BDA4BC15E0B141AD99791282A13
```

To combine these fragments into a single session, hits 5-7 should have the same TLTSID as hits 1-4. The configuration is as follows:

```
PrimarySessField=TLTSID
PrimaryLooseStrict=Strict
PrimaryMaxFieldLen=36
SecondarySessField=User-Key
SecondaryLooseStrict=Strict
SecondaryMaxFieldLen=20
```

When Hit3 is processed, TLSessioning notes the presence of User-Key and associates the SessionID (in this case, C70C0F4F451ED57190F8D5A059A1D071) with it. When Hit5 arrives, the TLTSID changes, indicating the start of a new session. While this TLTSID is appearing for the first time, TLSessioning already associates the User-Key value to an existing TLTSID, so the first identifier (C70C0F4F451ED57190F8D5A059A1D071) replaces the new TLTSID.

- This User-Key value is also associated with the new TLTSID. When Hit7 is processed without a User-Key value, TLSessioning can continue to associate the correct TLTSID with this hit.

Actual TLSessioning Configuration Examples

Example 1

This simple example shows sessioning on one REQ buffer field USERID, which can be a maximum of 32 bytes long.

Since there is no REQFilterTCL parameter, all hits are subject to sessioning. From analysis of the USERID field, the USERID was determined to be in GUID format, so the default hash key (bytes 5 through 8) of USERID is used.

```
[TLSessioning]
TypeName=TLSessioning
DLL=SessionAgentRulesEngine.dll
DownStreamConfigSection=Null
ScriptTrace=OFF
ResponseType=All
EnvironmentScript=EngineEnvironment.tcl
ActionScript=TLSessioning.Action.tcl
PreProcScript=TLSessioning.PreProc.tcl
MaxSessions=10000
PrimarySessField=USERID
PrimaryLooseStrict=Strict
PrimaryMaxFieldLen=32
```

Example 2

Example 2 is a slight elaboration on example 1, using JSESSIONIDs. Only hits where TealeafPassiveCapture2 is the CaptureSource are used.

Examination of some JSESSIONID examples reveals the following:

```
JSESSIONID=0000NMkvrBPJZ_CDI6uwIGn2mc5:-1
JSESSIONID=0000Fnvv6ZSGhoYwYYGnhO0o9uP:-1
JSESSIONID=0000RxQRv-FOyXbf_HqSo8sgE9t:-1
JSESSIONID=0000h9fQp-aVTadt7TAw4IksSXP:-1
JSESSIONID=0000BvLWMKVi8qNs8G6OC12tF8V:-1
JSESSIONID=0000b3N00Y8Af0Miv54CkeijtTL:-1
```

Bytes 5 through 27 are the sessioning field, and bytes 5 through 9 are the hash key.

The appropriate configuration is the following:

```
[TLSessioning]
TypeName=TLSessioning
DLL=SessionAgentRulesEngine.dll
DownStreamConfigSection=Null
ScriptTrace=OFF
ResponseType=All
EnvironmentScript=EngineEnvironment.tcl
ActionScript=TLSessioning.Action.tcl
PreProcScript=TLSessioning.PreProc.tcl
MaxSessions=10000
REQFilterTCL=string equal "TealeafPassiveCapture2" \
[REQBufVal "CaptureSource"]
PrimarySessField=JSESSIONID
PrimaryLooseStrict=Strict
PrimaryMaxFieldLen=32
PrimarySessFieldMaskOFF=4 26
PrimaryHashKeyOFF=4 8
```

Tealeaf Session Agents

- “Adding a Session Agent” on page 226
- “Archive Session Agent” on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Canister Session Agent” on page 236
- “Cookie Parser Session Agent” on page 238
- “Data Drop Session Agent” on page 241
- “Data Parser Session Agent” on page 246
- “Decouple Session Agent” on page 250
- “Extended Decoupler Session Agent” on page 252
- “Extended Privacy Session Agent” on page 261
- “Health-Based Routing (HBR) Session Agent” on page 263
- “Inflate Session Agent” on page 271
- “JSON Mobile Parser Session Agent” on page 275
- “Managed Code Session Agent” on page 287
- “Null Session Agent” on page 290
- “Privacy Session Agent” on page 291
- “Real-Time Monitoring and Alert (RTA) Session Agent” on page 321
- “Response Tags to Request Session Agent” on page 326
- “RTA Split Session Agent” on page 328
- “Sessioning Session Agent” on page 332
- “Session Router Session Agent” on page 330
- “Socket Session Agent” on page 335
- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- Tealeaf Sessioning Session Agent
- “TimeGrades Session Agent”
- “TLI Session Agent” on page 368
- “URL Decode Session Agent” on page 382

TimeGrades Session Agent

The TimeGrades session agent assigns a grade to a hit in the following three areas:

- **Web Server generation time:** How long it takes the Web server to serve up the page.
- **Network time:** Measures network speed based on how much time a packet spent on the network. This information is available only from a Passive Capture host machine.
- **Round Trip time:** How long it takes an arbitrary packet to travel from the client to the Web server. This information is available only from a Passive Capture host machine.

Based on these three criteria, TimeGrades assigns the hit a grade of `Excellent`, `Normal`, `HighNormal`, or `High`. These values are paired with numbers assigned to them in the TimeGrades TCL script.

Adding the Session Agent_g

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226.

For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

The remainder of this page describes configuration options and how to change them through the `TealeafCaptureSocket.cfg` file stored on the server. These settings are also available through the Pipeline Editor, which is the recommended method for configuring session agents.

Configuration Settings

The following settings are available for this session agent.

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

In each case, the entry is a specified set of values. See “Assigning Grades.”

Table 40. Configuration Settings

Display Name	Name	Description
`Web Server Time Breaks`	`WSGenBreaks`	List of web server page generation time grade breaks (`<value>:<description>`) separated by commas.
`Network Transit Breaks`	`NetworkTransitBreaks`	List of network transit time grade breaks (`<value>:<description>`) separated by commas.
`RoundTrip Breaks`	`RoundTripBreaks`	List of round trip time grade breaks (`<value>:<description>`) separated by commas.

Assigning Grades

The following is a sample input string for `WSGenBreaks`:

```
.20:ExcellentWS,1.0:NormalWS,2.0:HighNormalWS,4:HighWS
```

The following is a sample input string for `NetworkTransitBreaks`:

```
.5:ExcellentNT,1:NormalNT,2.1:HighNormalNT,5:HighNT
```

The following is a sample input string for `RoundTripBreaks`:

```
.5:ExcellentRT,1.0:NormalRT,2.25:HighNormalRT,3.5:HighRT
```

How Grades Are Applied

TimeGrades adds these scores to the hits, based on the raw values it receives. Any number above the highest defined value (e.g., `5`) is automatically assigned a grade of `HighNormal`. This grade can be configured to have a different label by adding the

desired description in the `set LastNTDesc`, `set LastRTDesc`, and `set LastWSDesc` sections of the TCL script. If a new name is added, it will appear as `High <New Name>`.

For example:

```
set LastWSDesc [GetValue $ConfigSection "LastWSDescription=Extra"]
```

results in the following as the highest grade: `High Extra`

Tealeaf Session Agents

- "Adding a Session Agent" on page 226
- "Archive Session Agent" on page 227
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- "Socket Session Agent" on page 335
- "Statistics Logger Session Agent" on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- "Tealeaf Reference Session Agent - Legacy Mode" on page 357
- "Tealeaf Sessioning Session Agent" on page 360
- TimeGrades Session Agent
- "TLI Session Agent"
- "URL Decode Session Agent" on page 382

TLI Session Agent

The TLI session agent can be deployed to generate TLI files in real-time based on the session data passed through a Windows pipeline and captured for storage. A **TLI file** is a database of static content such as images, JavaScripts, and stylesheets that can be referenced during replay, instead of going to the origin server. This archive of static content improves replay performance without the potential connectivity issues or distortion of performance statistics on the production web application.

Note: The TLI session agent is used to add content to static archives (TLI files). For more information on Tealeaf static archives, see "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

Replay using TLI files is supported through the IBM Tealeaf CX RealiTea Viewer and Browser-Based Replay.

- See "Using Static Archives in RTV" in the *IBM Tealeaf RealiTea Viewer User Manual*.
- For BBR users, replay of static content is transparent.

This section provides configuration steps on the details of deploying the TLI session agent, configuring the TLI pipeline, and splitting static content from the main processing pipeline for the TLI server.

- For more information on the other configuration steps required to set up TLI servers, see "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

Prerequisites

Note: Depending on the volume of static content in your web application and daily traffic, enabling the capture of static content can significantly increase the volume of data that is captured, processed, and stored by Tealeaf. For more information, contact Tealeaf Professional Services.

Setting up TLI Management

Deployment of this session agent and capture of static content requires end-to-end configuration of Tealeaf. Before you begin, you should familiarize yourself with the requirements and perform the configuration of the session agent and its pipeline within the context of the overall steps. See "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuring Pipelines for Static Archives

The basic architecture for TLI processing pipelines is to split content from one of your existing Windows pipelines and to send the content to a Windows pipeline dedicated to inserting static content into `.TLI` files.

- See “Deployment Assumptions.”

Static archiving requires changes to the following pipelines:

- “Main processing pipeline” on page 371 - In your main Windows processing pipeline, you must insert the RTA session agent to forward static content to the TLI server.
  - See “Main processing pipeline” on page 371.
- “TLI processing pipeline” on page 370 - On the TLI server, you must configure a pipeline to capture the static content and store it in the appropriate TLI file.
  - See “Main processing pipeline” on page 371.

Deployment Assumptions

The configuration instructions listed below assume that:

- The TLI pipeline is installed on a separate machine dedicated to capturing static content and storing it in TLIs. This TLI server has no other pipelines on it.

- In a Canister pipeline, static content is split from the pipeline and forwarded to the TLI server.

Note: The TLI session agent should not be deployed in a Windows pipeline where other processing occurs. This session agent requires a dedicated Windows pipeline and, if possible, a separate dedicated machine.

Other deployments are possible. For more information, please contact Tealeaf Professional Services.

Configuration Workflow

Static content should be separated from other session data as early as possible during processing on the Windows servers. Since the static content volumes can be quite large, you should minimize processing it with other session agents, which will not be able to take action on this mostly binary data. It is recommended to deploy the RTA session agent immediately after a Decouple session agent at the top of each Windows pipeline. Additional information is provided in the configuration workflow.

1. Before you begin, Tealeaf software must be installed on the TLI server. See "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.
2. Through TMS, access the Pipeline Editor on the TLI server.
3. Create a new pipeline. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
4. Specify the session agents of the TLI processing pipeline.
   - See "TLI processing pipeline."
5. Insert the TLI session agent. See "Adding the Session Agent" on page 376.
6. Configure the parameters of the TLI session agent. See "Configuring the TLI Session Agent" on page 376.
7. The TLI server is now configured and ready to receive data from the main Windows pipeline.
8. Through TMS, insert the RTA session agent into the pipeline on the Canister or HBR machine that will forward static content to the TLI server. This session agent must be configured to pass response content of the appropriate mimetypes to the TLI processing pipeline. See "Main processing pipeline" on page 371.
9. When you have completed the configuration, you should enable capture of a single content type through the PCA to test. You can use this test to determine static content capture and storage and potential impacts on storage requirements and bandwidth. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.
10. You can continue to enable content types as needed.

TLI processing pipeline

The pipeline that is used to insert static content into the current `.TLI` file requires the following minimum configuration:

```
Decouple > Inflate > TLI > Null
```

Note: For the TLI processing pipeline, Tealeaf recommends using the Decouple session agent, instead of DecoupleEx. The DecoupleEx session agent includes spooling capabilities, which can delay insertion into the TLI database and disrupt timestamps on the objects.

- Outside of the TLI environment, TLI recommends the DecoupleEx session agent for pipelines that process session hits.

Note: The TLI session agent must be configured so that its downstream session agent is the Null session agent. See “Adding the Session Agent” on page 376.

Note: In almost all environments, the Privacy session agent is not necessary for the TLI pipeline. Since most static content is binary or script files, it is unlikely that any static content requires security measures. As a general guideline, if an object requires privacy to be applied to it, it probably does not belong in a static archive.

Main processing pipeline

Deploy RTASplit

Below, you can review the minimum main content processing pipeline as a list of session agents. Specifically, the RTASplit session agent needs to be inserted and configured to direct the static content to the TLI processing pipeline.

```
Decouple > RTASplit > (other session agents, including Privacy) > Null
```

Note: The RTASplit session agent should be deployed as early as possible in the pipeline, so that downstream session agents do not need to process static content unnecessarily. Tealeaf recommends deploying it immediately after Decouple. This deployment may impact spool file sizes.

RTASplit can be deployed through the Pipeline Editor in TMS. When the session agent is added through TMS:

- The RTASplit session agent in the pipeline needs to be configured. See “Configure RTASplit.”
- An RTASplit configuration file reference is added beneath the Transport Service node on the server where it has been deployed. This `ini` file is used to defined the rules applied to RTASplit. See “RTASplit rules” on page 372

  See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

Configure RTASplit

When the RTASplit session agent has been deployed in the main processing pipeline, you can use the following example configuration as the basis for modifying the session agent's behavior.

- Key elements of the configuration are described below the sample.

```
[RTASplit]
TypeName=RTASplit
DLL=SessionAgentPipelineSplitter.dll
DownStreamConfigSection=<NEXT CONFIG SECTION>
ScriptTrace=OFF
RTAIni=RTASplit.ini
ResponseType=All
EnvironmentScript=EngineEnvironment.tcl
PreProcScript=RTA.PreProc.tcl
ActionScript=RTA.Action.tcl
# TLI pipeline
PipelineConfig1=HitRouter_Pipeline1.cfg
# Null pipeline
PipelineConfig2=HitRouter_Pipeline2.cfg
```

The following are key elements in the configuration that you may wish to modify.

Note: Tealeaf recommends that you leave the other configurations unmodified, unless explicitly directed to do otherwise by Tealeaf.

Field **Description**

PipelineConfig1
Filename of the pipeline that receives the content of Rule 2, as defined below.

Note: Do not change this filename.

PipelineConfig2
Filename of the pipeline that receives the content of Rule 1, as defined below.

Note: Do not change this filename.

Adding pipelines

For TLI configuration, no additional pipelines are required. If your environment requires additional RTA configurations:

- Add a reference similar to the following:

```
# Null pipeline
PipelineConfig3=HitRouter_Pipeline3.cfg
```

- Copy one of the other pipeline configuration files and edit it to contain the session agent configuration required for your new pipeline.
- Edit the RTA rules to send any required data to the new pipeline.

Note: If you need to comment out a rule, in a hash mark (#) at the beginning of the line, which disables them.

RTASplit rules

The RTASplit session agent needs to be configured to detect the mimetypes for responses that should be forwarded to the TLI processing pipeline.

Below, some example rules are provided that can be used to direct content to the destination system.

To configure RTASplit rules:

1. In the Tealeaf Portal, select **Tealeaf** > **TMS**. The Tealeaf Management System is displayed. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
2. In the View drop-down, select `Servers`.
3. Select the server where the main processing pipeline is located.
4. Click the Transport Service node.
5. Click the RTASplit configuration file node.

   Note: If this file is not present, the RTA session agent has not been deployed in your pipeline. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
6. Click **View/Edit**.
7. The RTA rules configuration file is displayed.

Below, a set of RTAsplit rules have been provided to divert static content from the pipeline in which the RTA session agent is deployed to the TLI server for capture by the TLI session agent.

```
#-------------------------------------------------------------------------
# The below rules searches the ResponseType for a match and routes the current
# hit to Pipe0 or Pipe1.
# This is an example is intended to be used with a TLI session agent
# configured in Pipe1.
#
<RULE NUM="1" STATUS="ENABLED" DESCRIPTION="ResponseType to Pipe 2"
   Stoprules="YES" >
  <GROUP TYPE="REQTest" REQF="ResponseType" REQOP="EQ" REQVAL="unknown">
   </GROUP>
  <GROUP TYPE="REQTest" REQF="StatusCode" REQOP="EQ" REQVAL="304">
   </GROUP>
  <GROUP TYPE="REQTest" REQF="URL" REQOP="REGEXPR"
     REQVAL="(\.js|\.gif|\.jpg)">
   </GROUP>
<GROUP TYPE="SetPipeID" PipeID="2" Type="SET">
   </GROUP>
</Rule>

<RULE NUM="2" STATUS="ENABLED" DESCRIPTION="ResponseType to Pipe 1"
   Stoprules="YES" >
  <GROUP TYPE="REQTest" REQF="ResponseType" REQOP="REGEXPR"
   REQVAL="(image|x-javascript|css)">
   </GROUP>
  <GROUP TYPE="SetPipeID" PipeID="1" Type="SET">
   </GROUP>
</Rule>
#-------------------------------------------------------------------------
```

Rule **Description**

RULE 1

This set of rules sends non-static content to Pipeline 2 (See `HitRouter_PipeLine2_TLI_sample.cfg` below), based on the following groupings:

- All content with `unknown` response type
- All content that contains a Status Code 304 message. This code indicates that the content has not been changed since the last time it was requested, which means that it has been cached in the browser and already processed for capture as a new content item.
- All content that does not have a `.js`, `.gif`, or `.jpg` extension
- See “Pipeline 2” on page 375.

RULE 2

This set of rules sends static content to Pipeline 1 (See `HitRouter_PipeLine1_TLI_sample.cfg` below), based on the regular expression that matches the response type to types `image`, `x-javascript` or `css`.

Note: Depending on the content types in your web application, this list may need to be expanded. Additional content types should be enabled for capture through the Pipeline tab of the PCA Web Console. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

- See “Pipeline 1” on page 374.

RTASplit Pipeline configuration

Below, you can see example configurations for pipelines that are specific to the RTASplit session agent. When data is passed through the RTASplit session agent, the rules above dictate the pipelines to which the data is passed. Based on the

following configurations, the data is processed and, when configuring RTA for static content management, forwarded to the TLI server through Pipeline 1.

Note: When used in the TLI pipeline, the RTA session agent is an advanced session agent and should only be deployed in consultation with Tealeaf Professional Services.

Pipeline 1

This pipeline receives the static content from the RTA session agent, as defined in Rule 2 above.

```
[StatusMaster]
DLL=StatusMaster.dll
AppName=TeaLeafHR1

[Globals]
DownStreamConfigSection=Decouple

#  Child pipelines should have a Decouple session agent, the Decoupler
#  allows for sending hits down multiple pipelines to be a parallel operation.
#  Otherwise data sent down multiple pipelines would become a serial
#  operation, and any delay (eg, socket having to reconnect) will impact the
# speed/performance of possible other child pipelines.
#
[Decouple]
TypeName=Decouple
DLL=SessionAgentDecouple.dll
MaxQueueSize=2500
DownStreamConfigSection=Inflate

[Inflate]
TypeName=Inflate
DLL=SessionAgentInflate.dll
UnReqCancelled=True
MaxInflateSize=512KB
DownStreamConfigSection=RTA
#DownStreamConfigSection=TLI

# Inflate or Deflate Stuff
#Mode=Deflate
Mode=Inflate


# use only when querystring needs to be modified.
[RTA]
TypeName=RTA
DLL=SessionAgentRulesEngine.dll
DownStreamConfigSection=TLI
RTAIni=TLI_RTA.ini
ScriptTrace=ON
ResponseType=All
EnvironmentScript=EngineEnvironment.tcl
PreProcScript=RTA.PreProc.tcl
ActionScript=RTA.Action.tcl

[TLI]
TypeName=TLI
DLL=SessionAgentTLI.dll
MaxImageSize=1MB
DownStreamConfigSection=Null
MimeTypes=image/jpeg,image/gif,application/x-javascript

#-- Leave it commented out for <installbasedir>\System\TLI
#TliDirectory=C:\Tealeaf\System\TLI
```

```
Log=OFF
LogLevel=INFO
#-- Leave it commented out for <installbasedir>\logs
#LogDir=C:\TeaLeaf\Logs

# Disk Quota Controls (identical to SessionAgentArchive)
#
DiskQuotaDLL=DiskQuota.dll
DiskQuotaPctFree=10
DiskQuotaScanTimeSeconds=20


[Null]
TypeName=Null
DLL=SessionAgentNull.dll
```

Pipeline 2

Based on the rules above, this child pipeline manages the non-static content. As such, content passes through the Decouple session agent, which manages the throttling of content in the pipelines so that processing can occur in parallel. The pipeline is immediately terminated with the Null session agent, after which it is passed back to the parent pipeline, entering the session agent defined to receive content after the RTA session agent.

```
[StatusMaster]
DLL=StatusMaster.dll
AppName=TeaLeafHR2

[Globals]

DownStreamConfigSection=Decouple

#  Child pipelines should have a Decouple session agent, the Decoupler
#  allows for sending hits down multiple pipelines to be a parallel operation.
#  Otherwise data sent down multiple pipelines would become a serial
# operation, and any delay (eg, socket having to reconnect) will impact
# the speed/performance of possible other child pipelines.
#
[Decouple]
TypeName=Decouple
DLL=SessionAgentDecouple.dll
MaxQueueSize=2500
DownStreamConfigSection=Null

[Null]
TypeName=Null
DLL=SessionAgentNull.dll
```

Disable DelImages

If you have deployed the Data Drop session agent in your TLI pipeline or any pipeline that feeds the TLI pipeline, please verify that the DelImages feature has been disabled. Enabled by default, this feature deletes static content, including images, stylesheets, and Javascripts, from hits passing through the pipeline. For the static archive to properly capture this content, it must remain in the hit until the TLI session agent can see it.

Note: Beginning in PCA Build 3502, this functionality can be enabled in the PCA pipeline. If you have installed PCA Build 3502 or later, please verify that this feature is disabled in the Pipeline Tab. See "Delete Images on PCA Side" in the *IBM Tealeaf Passive Capture Application Manual*.

See “Data Drop Session Agent” on page 241.

Adding the Session Agent

Note: Do not enable the capture of static content on the PCA until you have completed the configuration of the TLI session agent.

To add the session agent, you can use the TMS pipeline editor to create the pipeline and specify most of its session agent:

```
Decouple > Inflate > TLI > Null
```

All of the above session agents can be added through the Pipeline Editor in the Tealeaf Management System.

Please complete the following steps to insert the TLI session agent into your capture pipeline on the TLI server.

Note: These steps assume that you have already created the pipeline with all session agents except for the TLI session agent and saved the configuration to the server.

- For more information on creating the pipeline, see "Adding Pipelines" in the *IBM Tealeaf cxImpact Administration Manual*.
- For more information on adding a session agent, see "Adding Session Agents" in the *IBM Tealeaf cxImpact Administration Manual*.
- For more information on where you perform these configuration changes through the Portal, see "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

1. Insert the TLI session agent in your pipeline.
2. Place the session agent immediately after the Inflate session agent.
3. Edit the session agent.
4. Configure the settings as needed. See “Configuring the TLI Session Agent.”
5. In the TLI configuration settings, verify that the following setting is specified:
   ```
   DownStreamConfigSection=Null
   ```
6. The above setting identifies that the next session agent after the TLI session agent is the Null session agent, which is the proper configuration.
7. Save the configuration. You have now specified the pipeline.
8. The next step is to configure the other settings for the session agent. You can leave the file open to complete the next section. See “Configuring the TLI Session Agent.”

Configuring the TLI Session Agent

After you have configured the TLI pipeline to capture static content, you must configure the TLI session agent in the pipeline.

This session agent scans content based on a configured list of mime types. When matching mime types are detected, the session agent computes a unique identifier for the object using a computed checksum of the content and the URL for where the content originated. This identifier is compared to identifiers for objects already stored in the active `.TLI` file. If there is no match with an existing identifier, the static object is inserted into the static archive.

Note: Static content served by a content deliver network such as Akamai is downloaded to the visitor browser and is thus available for capture by the TLI session agent.

By default, the TLI session agent is configured to capture the following mime types:

- image/jpeg
- image/gif
- application/x-javascript

Note: If the PCA has not yet been configured to capture the desired mime types, they never appear in the Windows pipeline and are not captured at this time. Enabling capture of these mimetypes through the PCA is the last step in configuration, after which static content is flowing through the system and data volume may rise significantly.

Below is a sample configuration for the TLI session agent as it appears in the TealeafCaptureSocket.cfg file.

Note: Where possible, you should use the Tealeaf Management System to perform your configuration changes. The information below is provided, as it contains additional documentation.

```
#-------------------------------------------------------------------------------
# Tealeaf Image Content File
#
# MimeTypes         - Mimetype(s) to add to TLI file.
# MaxImageSize      - Max size of individual content added to TLI file.
# TLIDirectory      - Directory where TLI files are written.
#
# Logging Controls
#     Log        -- either ON/OFF
#     LogLevel   -- either ERROR/WARNING/INFO/DEBUG
#     LogDir     -- log directory.  Default "<Tealeaf Install Directory>\Logs"

[TLI]
TypeName=TLI
DLL=SessionAgentTLI.dll
MaxImageSize=1MB
DownStreamConfigSection=Null
MimeTypes=image/jpeg,image/gif,application/x-javascript

#-- Leave it commented out for <installbasedir>\System\TLI
#TliDirectory=C:\Tealeaf\System\TLI

Log=ON
LogLevel=INFO
#-- Leave it commented out for <installbasedir>\logs
#LogDir=C:\TeaLeaf\Logs

# Disk Quota Controls (identical to SessionAgentArchive)
#
DiskQuotaDLL=DiskQuota.dll
DiskQuotaPctFree=20
DiskQuotaScanTimeSeconds=20
```

Setting Description

DLL Set this value to SessionAgentTLI.dll.

MaxImageSize
The maximum permitted size for image files. By default, this value is set to 1 MB.

DownStreamConfigSection
This setting specifies the next session agent in the pipeline to which the output of this one is passed.

Note: For the TLI session agent, this value must be set to `Null`. Do not pass static content to other session agents after it has been inserted or rejected by the TLI session agent.

MimeTypes
Defines the mimetypes that are captured into the static archive. By default the following mimetypes are captured into static archives:
`image/jpeg,image/gif,application/x-javascript`

Note: These mimetypes must be configured to be captured by the IBM Tealeaf CX Passive Capture Application, which drops static content by default. See "PCA Web Console - Pipeline Tab" in the *IBM Tealeaf Passive Capture Application Manual*.

Note: If the TLI server detects a content type that is not in this list, the content type is automatically dropped from further processing.

Log To enable logging, set this value to `ON`. See “Logging” on page 380.

LogLevel
Set the logging level for the TLI session agent.

Note: The only logging levels currently supported are `INFO/DEBUG`. See “Logging” on page 380.

DiskQuotaDLL
Specifies the `.DLL` that handles disk management monitoring of the TLI directory. This value should be set to `DiskQuota.dll`. See “Disk space management” on page 381.

DiskQuotaPctFree
Configures the lowest permitted percentage of free disk space. See “Disk space management” on page 381.

DiskQuotaScanTimeSeconds
Interval in seconds when the disk manager scans the TLI directory for free space. See “Disk space management” on page 381.

Roll time

The TLI session agent is automatically configured to roll the day's static archive at 12:01 AM. When the archive is rolled, the current static archive is closed, and a new `.TLI` file is created, and static content is added to it. Through the Scheduling Service, you can configure merge jobs to merge the daily TLI content into the monthly archive. See "Configuring TLI Jobs" in the *IBM Tealeaf CX Configuration Manual*.

The TLI session agent can be deployed through the TMS Pipeline Editor. Additional configured is required. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

TLI filenames

`.TLI` files are stored in the TLI directories using the following naming patterns.

TLI file
Filename

Current Daily
`StaticFiles_YYYYMMDD.tli`

Monthly
`MergeStaticFiles_YYYYMMDD.tli`

See "TLI Files" in the *IBM Tealeaf cxImpact Administration Manual*.

Specifying TLI directories

The TLI session agent requires three directories to be configured for storage of TLI-generated data:

Table 41. Specifying TLI directories

Directory	Setting	Description
TLI Directory	`TLIDirectory`	The directory where daily TLIs are created and stored before merging into the monthly TLIs, which are stored in the same directory **Note:** If you change this directory from its default value, you must apply the change to the `TLIPath` setting in Search Server configuration through TMS. See "Changing TLI directories in Search Server."
TLI Backup	`TLIBackupPath`	The directory where daily TLIs that have been merged are stored after they have been removed from the main TLI directory. This setting is configured through Search Server. See "Changing TLI directories in Search Server." **Note:** This directory cannot be within the main TLI directory. If you change this directory from its default value, you must apply the change to Search Server through TMS. See "Changing TLI directories in Search Server." For more information on merging TLI files, see "Configuring TLI merge jobs" in the *IBM Tealeaf CX Configuration Manual*
Logs	`LogDir`	The directory where TLI log files are stored when logging is enabled. By default, logging is disabled, and this directory is the main Tealeaf log directory. See "Logging" on page 380.

Changing TLI directories in Search Server

When you change the setting for the main TLI directory or the TLI backup directory, you must apply the change to Search Server configuration through TMS. Please complete the following steps to complete the change.

1. After you have applied the change to the TLI session agent, save the configuration. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
2. If you are not currently in the Tealeaf Management System, from the Portal menu, select **Tealeaf** > **TMS**. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
3. Click the WorldView tab.
4. From the View drop-down, select `Servers`.
5. Select the server where the TLI processing pipeline is located.

   Note: These updates need to be applied only to the Search Server hosted by the TLI server.
6. Open the Search Server node.
7. Click **Search Server configuration**.
8. In the Config Actions pane, click **View/Edit (Raw)**.
9. The raw configuration for Search Server is displayed. Click the Default node.
10. Specify the local file path for either or both of the following settings to match the value(s) you've specified for the TLI session agent:

    Search Server Setting
    Description

    `TLIPath`
    Main TLI directory setting. It should match the value for `TliDirectory` in the TLI session agent

    `TLIBackupPath`
    Setting for the TLI backup directory on the TLI server. It should match the value specified for `TliBackupDir` in the TLI session agent.

    Note: This directory cannot be within the main TLI directory. It may be a separate directory on the same storage device, which is recommended. If you create this directory on the same storage volume as the main directory and enable monitoring of the disk space, this backup directory is effectively monitored for free space. The directory is not monitored if it's on another storage device. See “Disk space management” on page 381.
11. Save the configuration changes.

Changing TLI directories in Replay Server

Each instance of the Replay Server in your environment must be aware of the location of the TLI server and appropriate path values. This configuration must be applied to each Replay Server instance through TMS.

- See “Configuring the Replay Server” on page 69.

Logging

The TLI session agent can be configured to generate logging information.

Note: Debug log level generates information, warning, and error log messages, which may result in sizeable files. For this reason, logging is set to `INFO` by default.

To enable logging:

- In the TLI session agent, you must configure the following settings:

1. Configure the LogDir to the local directory where TLI session agent logs are to be stored.
   - If this value is not specified, the main Tealeaf log directory is used:
     <Tealeaf_install_directory>\Logs
2. Raise the LogLevel value from INFO to DEBUG, if needed.
3. Set the Log parameter to ON.

- Save changes.
- Debug log level messaging is enabled for the TLI session agent.
- Debug issues as needed.
- When you have resolved the issue, reset the log value from DEBUG.

If logging is enabled, the session agent writes a detailed log file that can be searched for errors. Search the file for the ERROR string.

Disk space management

The TLI session agent can be configured to monitor the available space on the storage device where the TLI main directory is located and generate a Windows event log alert when the percentage of free disk space drops below a specified threshold.

Note: TLI disk management monitoring applies only to the TLI main directory. If the TLI backup directory is on a different storage device, these tools do not track or alert free disk space in that directory.

To enable monitoring of disk space on the storage device where TLI files are written, please complete the following configuration steps.

Note: Before you begin using TLI session agent, you should determine the amount of disk space on the designated storage device and assess the potential impact of capturing static content. See "Assess Impact on Data Storage and Throughput" in the *IBM Tealeaf cxImpact Administration Manual*.

1. In the TMS Pipeline Editor, edit the TLI session agent configuration. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
2. Configure the following configuration settings:
   a. Set the DiskQuotaDLL value to DiskQuota.dll. No other value is currently supported.
   b. Set the minimum percentage of free disk space permitted on the storage device. When the available free disk space drops below this percentage, hits are dropped by the capture pipeline, and a message is generated in the Windows event log. The message is the following:
      ```
      Session Agent TLI: Disk quota check failed. Disk quota too low.
         Start dropping hits.
      ```
   c. Set the DiskQuotaScanTimeSeconds setting to the interval in seconds when the disk manager scans the TLI directory for free space. By default, this value is set to 20 seconds. It should not require changing.
3. Save the configuration changes.

If the minimum percentage threshold is crossed, an error message is generated in the Windows Event Log for the designated TLI server.

- You may monitor the Event Log for the TLI server through the Portal. See "Windows Event Log" in the *IBM Tealeaf cxImpact Administration Manual*.

These disk management controls are identical to those used by the Archive session agent. See “Archive Session Agent” on page 227.

Tealeaf Session Agents

- “Adding a Session Agent” on page 226
- “Archive Session Agent” on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Canister Session Agent” on page 236
- “Cookie Parser Session Agent” on page 238
- “Data Drop Session Agent” on page 241
- “Data Parser Session Agent” on page 246
- “Decouple Session Agent” on page 250
- “Extended Decoupler Session Agent” on page 252
- “Extended Privacy Session Agent” on page 261
- “Health-Based Routing (HBR) Session Agent” on page 263
- “Inflate Session Agent” on page 271
- “JSON Mobile Parser Session Agent” on page 275
- “Managed Code Session Agent” on page 287
- “Null Session Agent” on page 290
- “Privacy Session Agent” on page 291
- “Real-Time Monitoring and Alert (RTA) Session Agent” on page 321
- “Response Tags to Request Session Agent” on page 326
- “RTA Split Session Agent” on page 328
- “Sessioning Session Agent” on page 332
- “Session Router Session Agent” on page 330
- “Socket Session Agent” on page 335
- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- “Tealeaf Sessioning Session Agent” on page 360
- “TimeGrades Session Agent” on page 366
- TLI Session Agent
- “URL Decode Session Agent”

URL Decode Session Agent

The URL Decode session agent is used to normalize characters in the `[urlfield]` section of the request buffer.

HTTP protocol does not allow for the native representation of some characters, such as colon, semicolon, space, and ampersand. Any extended characters (those with the high bit set) and any multi-byte characters are url-encoded.

- **Url-encoded** characters are represented as the hexadecimal value of the character preceded by the percent character (`%`).
- The space character is an exception to the above method. The space character is represented by the plus sign (`+`).
- For example the string `Now's the time` is url-encoded as `Now%27s+the+time`.

Adding the Session Agent

Session agents can be added through the Pipeline Editor in TMS. See “Adding a Session Agent” on page 226. For more information on the Pipeline Editor and TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Configuration Settings

The following configuration settings are available for this session agent:

- **`Display Name`** values are displayed in TMS, which is the recommended method for configuring session agents. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
- **`Name`** values are displayed in `TealeafCaptureSocket.cfg`.

Table 42. URL Decode Session Agent

Display Name	Name	Description
`ExcludeType1`	`ExcludeType1`	When specified, the entered CaptureSources/CaptureTypes are excluded from the URL Decode operation.
`ExcludeType2`	`ExcludeType2`	When specified, the entered CaptureSources/CaptureTypes are excluded from the URL Decode operation.
`Exclude Vars`	`ExcludeVars`	When specified, the listed variables in the `[urlfield]` section are excluded from the URL Decode operation.

Tealeaf Session Agents

- “Adding a Session Agent” on page 226
- “Archive Session Agent” on page 227
- "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Canister Session Agent” on page 236
- “Cookie Parser Session Agent” on page 238
- “Data Drop Session Agent” on page 241
- “Data Parser Session Agent” on page 246
- “Decouple Session Agent” on page 250
- “Extended Decoupler Session Agent” on page 252
- “Extended Privacy Session Agent” on page 261
- “Health-Based Routing (HBR) Session Agent” on page 263
- “Inflate Session Agent” on page 271
- “JSON Mobile Parser Session Agent” on page 275
- “Managed Code Session Agent” on page 287
- “Null Session Agent” on page 290
- “Privacy Session Agent” on page 291
- “Real-Time Monitoring and Alert (RTA) Session Agent” on page 321
- “Response Tags to Request Session Agent” on page 326
- “RTA Split Session Agent” on page 328

- “Sessioning Session Agent” on page 332
- “Session Router Session Agent” on page 330
- “Socket Session Agent” on page 335
- “Statistics Logger Session Agent” on page 337
- "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*
- “Tealeaf Reference Session Agent - Legacy Mode” on page 357
- “Tealeaf Sessioning Session Agent” on page 360
- “TimeGrades Session Agent” on page 366
- “TLI Session Agent” on page 368
- URL Decode Session Agent

CX Pipeline Utilities

To assist in the development, monitoring, and maintenance of your Tealeaf pipelines, several tools are included in your Tealeaf solution. Use the links below to access documentation on these utilities.

Pipeline Utility
Description

"TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*
You define and configure your Tealeaf processing pipelines through the Pipeline Editor in TMS. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

“TeaLeaf Archive Reader - Run Archived Sessions”
Reads Tealeaf archive files and sends them through configured pipelines for re-processing.

“TeaLeaf Capture Status - Pipeline Monitoring Utility” on page 386
Monitors status of Tealeaf capture pipelines.

Note: This utility is now available through the Tealeaf Portal, as well. See "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

“Privacy Tester Utility” on page 390
Test privacy rules, actions, and tests prior to deploying to the live capture stream.

- See “Privacy Tester Utility” on page 390.

TeaLeaf Archive Reader - Run Archived Sessions

The Archive Reader reads Tealeaf Archive (`.TLA`) files and sends the data through pipeline session agents, allowing for further processing of the data. The operations performed are typically those not performed during real-time data capture, either for convenience or performance reasons (such as applying a sophisticated Rules Engine script to the data that may have a negative impact on capture performance).

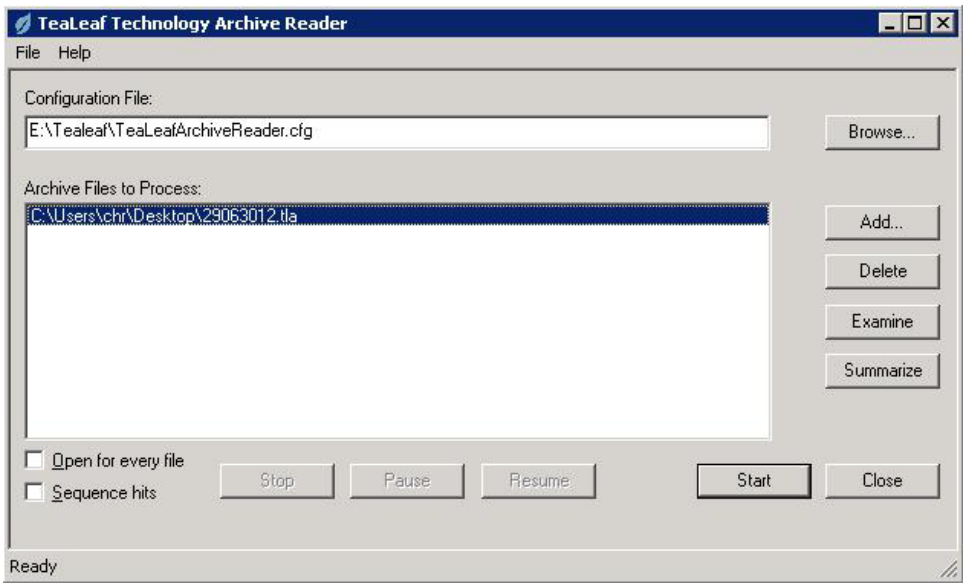
Before you begin, you should start the pipeline through which you are sending the `.TLA` file.

- See “Starting and Monitoring the Capture Pipeline across Multiple Servers” on page 385.

A configuration file is associated with the Tealeaf Archive Reader. The configuration file is similar to the capture configuration files.

To use the Tealeaf Archive Reader:

1. Launch the following executable:
   `<Tealeaf_install_directory>\TealeafArchiverReader.exe`
2. The Tealeaf Archive Reader is displayed:



3. In the Configuration File textbox, the path to the `TeaLeafArchiveReader.cfg` is displayed.
   - To select a different file, click **Browse...** and navigate to the file location.
4. To select a `.TLA` file, click **Add...**.
   - To examine the headers, requests, and responses of the selected file, click **Examine**.
   - To generate a summary of the selected file, click **Summarize**.
   - To remove a `.TLA` file from the server, select it and click **Delete**.
5. Options:
   - **Open for Every File** option can be used when the Capture Pipeline is set to terminate with the Archive session agent and new `.TLA` files are created in the process. If this option is selected, each `.TLA` file in the list is processed individually. If this option is not selected, the multiple files are processed as one `.TLA` file.
   - **Sequence Hits** option is used to process session hits in chronological order.
6. To begin processing the file, click **Start**.

Starting and Monitoring the Capture Pipeline across Multiple Servers

Start the receiving server before starting the Capture Pipeline. The receiving server is controlled by a Windows NT Service in the Control Panel. After the receiving server is started, the sending servers can be started.

The following procedures provide instructions for installing the service in the Control Panel and starting the server.

Starting the Capture Pipeline

Start the Capture Pipeline using the Tealeaf Transport Service in the Windows Control Panel's services applet. Verify the pipeline started by using the Event Viewer to look for errors from the Tealeaf application.

To start the Capture Pipeline across multiple servers:

1. From the **Start** menu, click **Settings** > **Control Panel**.
2. In the **Control Panel**, double-click **Services**.
3. Select the **TeaLeaf Transport Service**.
4. Click **Start**.
5. Click **Close** to close the Services window.
   To check the Event Viewer:
6. Go to **Start** > **Programs** > **Administrative Tools** > **Event Viewer.**
7. In the Event Viewer tree, select **Application Log**.
8. Review the **Source** column.
9. Verify that there are no error messages from the Tealeaf Transport Service.

Monitoring the Capture Pipeline across Multiple Servers

You can monitor Tealeaf server activity through the Tealeaf Capture Status utility or through the Tealeaf Management System.

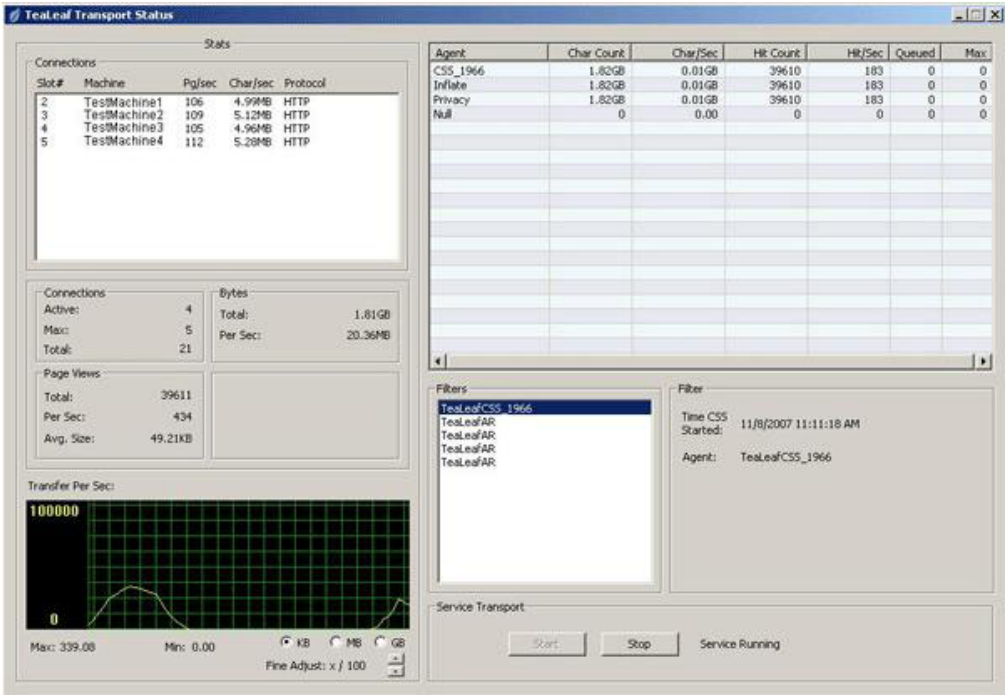
- See “TeaLeaf Capture Status - Pipeline Monitoring Utility.”
- For more information on TMS, see "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

TeaLeaf Capture Status - Pipeline Monitoring Utility

Through the Tealeaf Transport Status utility, you can monitor all Tealeaf capture and processing pipelines, including the processing by each agent in the pipeline, for all Tealeaf servers in your environment.

Note: The Tealeaf pipeline can also be monitored through TMS. In future releases, the separate utility may be deprecated. For more information on TMS, see See "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

The Tealeaf Transport Status utility is accessible through the following location in the Windows Start menu:



Filters

The filter list box shows the different session agents (in pipeline order) for each filter that is currently running on the system. After the name of the session agent there are statistics on everything from flow rate to whether a session agent is queuing data. When you click on each filter the active list of agents and their data will reflect which filter you are currently viewing. This will also change the filter statistics (next to the filter list) to reflect the start time and date and the name of the filter.

The filter list box is top level master control for monitoring the pipeline with the utility. Make sure you have selected the appropriate filter when monitoring stats for a particular pipeline.

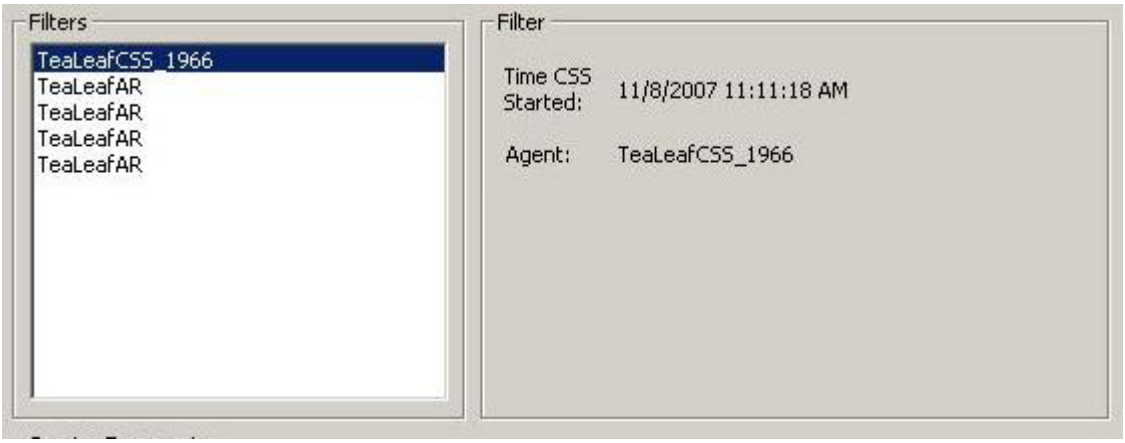


Figure 35. Filters List Box

Connections

The connections list shows active connections, their throughput, protocol, and the name of the machine they are on. All current connections are permanently displayed and cannot be added, removed or selected. The slot# is the memory address in Tealeaf's shared memory that the connection occupies.

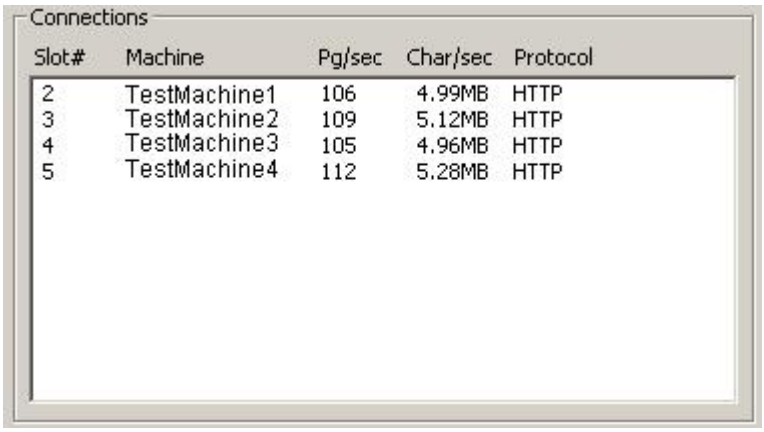

Connections
Slot# Machine Pg/sec Char/sec Protocol
2 TestMachine1 106 4.99MB HTTP
3 TestMachine2 109 5.12MB HTTP
4 TestMachine3 105 4.96MB HTTP
5 TestMachine4 112 5.28MB HTTP

Figure 36. Connections List Box

Below the connections list box, there are statistics that reflect the overall state of all the connections on the list.

- **Active:** The number of active connections at any given time.
- **Max:** The maximum number of connections allowed.
- **Total:** The total number of connections seen since the application was launched.

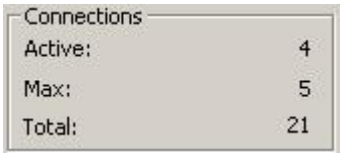


Figure 37. Connection Statistics

Next to the connection stats box, there is a box entitled "Bytes". This box shows the total throughput of all connections.

- **Total:** The total number of bytes that have gone through all the connections.
- **Per Sec:** The number of bytes per second that are going through all the connections.

Figure 38. Statistics on Bytes

Below the connections stats box, there is a set of stats regarding pages transferred.

- **Total:** The total number of pages seen since the launch of the utility.

- **Per Sec:** The number of pages seen in the last second.
- **Avg. Size:** The through put over the last second divided by the number of pages seen in the last second.

Figure 39. Page Statistics

Transfer Graph

The transfer graph is at the bottom left hand corner of the utility. It shows the total transfer in bytes of all connections each second. There are also several radio buttons allowing the user to change the magnitude of the graph for various levels of transfer. The reason the graph does not automatically re-calibrate for magnitude is that some sites can have large deltas in traffic. This would result in the graph constantly changing magnitude as traffic jumped from KB to MB and back frequently. This also allows the user to watch just the lowest magnitude or just the highest magnitude moments during transfer.

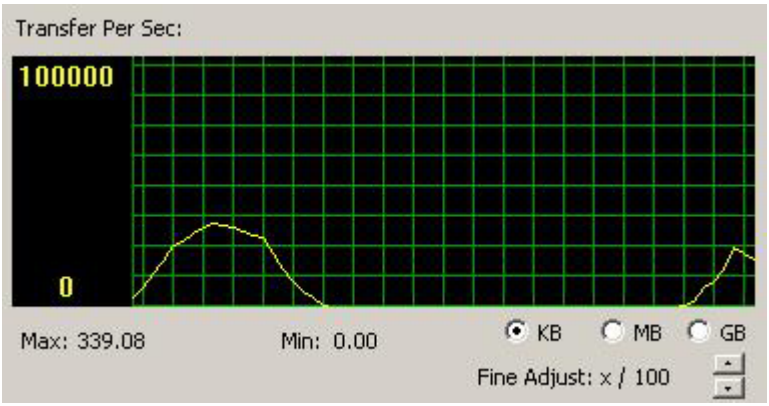


Figure 40. Transfer Graph

The graph also has a fine granularity control which allows you to divide the values plotted by orders of magnitude. This is useful when traffic is maxing out the KB setting, but does not register fine enough deltas to be seen under the MB setting.

Transport Service Console

The Capture Status utility also allows you to stop and start the Transport Service to easily make changes to the pipeline. This is useful when you need to make changes to the SessionAgent configuration and must restart the service to reflect your changes.

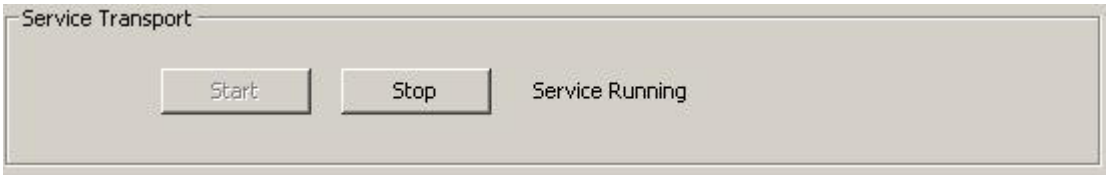


Figure 41. Transport Service

- To stop the Transport service, click **Stop**.
- To start or restart the Transport service, click **Start**.

Minimize

Figure 42. Minimized utility

Lastly, when minimized the utility now goes to the system tray. This allows it to be used much like the Task Manager and recalled at your convenience.

Figure 43. Tealeaf System Tray menu

To re-instate the utility, simply double click or right click on the Tealeaf icon in the system tray and select **Restore**. You can also close the utility from this menu.

Privacy Tester Utility

The Privacy Tester utility enables Tealeaf developers to create privacy rules and to test their behavior in the Tealeaf pipeline without having to submit hit data to it. In Privacy Tester, you can define and edit privacy rules and then test them against data that you paste into the utility.

Note: The Privacy Tester utility is accessible through the configurations for Privacy, Extended Privacy, and Real-Time Monitoring Alert session agents. These session agents must be included in your Windows pipeline in order to enable the editing of rules configuration. For more information on adding these session agents, see "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

Versions

Privacy Tester can be used to test the rules used by the following Tealeaf session agents, which are defined in the configuration files listed below:

Table 43. Versions

Session Agent	Configuration File	Session Agent Documentation
Privacy	`Privacy.cfg`	"Privacy Session Agent" on page 291
PrivacyEx	`Privacy.cfg`	"Extended Privacy Session Agent" on page 261
RTA	`RTA.ini`	"Real-Time Monitoring and Alert (RTA) Session Agent" on page 321

Note: Before you begin editing, you should save a backup version of the file. See "Saving" on page 402.

Starting Privacy Tester

For Privacy Session Agents

For the Privacy and Extended Privacy session agents, please complete the following steps to run the privacy tester:

1. Login to the Tealeaf Portal as an administrator.
2. To open the Tealeaf Management System, select **Tealeaf** > **TMS** from the Portal menu.
3. If you have not done so already, you must add the Privacy or Extended Privacy session agent through the Pipeline Editor in TMS. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
4. In TMS, select `Servers` from the View drop-down.
5. Open the following node:
   `Transport Service > Privacy Filter`
6. Click **View/Edit**.
7. The Privacy Filter configuration is displayed. See "Privacy Session Agent" on page 291.
8. Through the Privacy Filter configuration, you can test the privacy rule definitions for either of the versions of privacy rules supported by Tealeaf:
   a. To test Privacy session agent rules, click **Test (Privacy)**.
      - The Privacy session agent provides a base set of privacy rules. It has been superseded by the Extended Privacy session agent. See "Privacy Session Agent" on page 291.

   b. To test Extended Privacy session agent rules, click **Test (PrivacyEx)**.
      - The Extended Privacy session agent provides all of the privacy rules of Privacy session agent, as well as faster search and internationalization support. See "Extended Privacy Session Agent" on page 261.

        Note: The Privacy session agent has been superseded by the Extended Privacy session agent. Whenever possible, use PrivacyEx. See "Extended Privacy Session Agent" on page 261.
9. The Privacy Tester opens.

Note: If a configuration is shared, you may select the server on which to run the tester. Configurations that are not shared are tested on the server that owns the configuration.

10. The utility has the same functions for either version of the Privacy Tester.

For Real-Time Monitoring Alert Session Agent

For the RTA session agent, please complete the following steps to run the Privacy Tester for RTA:

1. Login to the Tealeaf Portal as an administrator.
2. To open the Tealeaf Management System, select **Tealeaf** > **TMS** from the Portal menu.
3. If you have not done so already, you must add the RTA session agent through the Pipeline Editor in TMS. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.
4. In TMS, select **Servers** from the **View** menu.
5. Open the following node:

   `Transport Service > RTA configuration`
6. Click **View/Edit**.
7. The RTA configuration is displayed. See “Real-Time Monitoring and Alert (RTA) Session Agent” on page 321.
8. To test the RTA configuration rules, click **Test(RTA)**.
9. The Privacy Tester opens.

   Note: If a configuration is shared, you may select the server on which to run the tester. Configurations that are not shared are tested on the server that owns the configuration.
10. The utility has the same functions for either version of the Privacy Tester.

Workflow

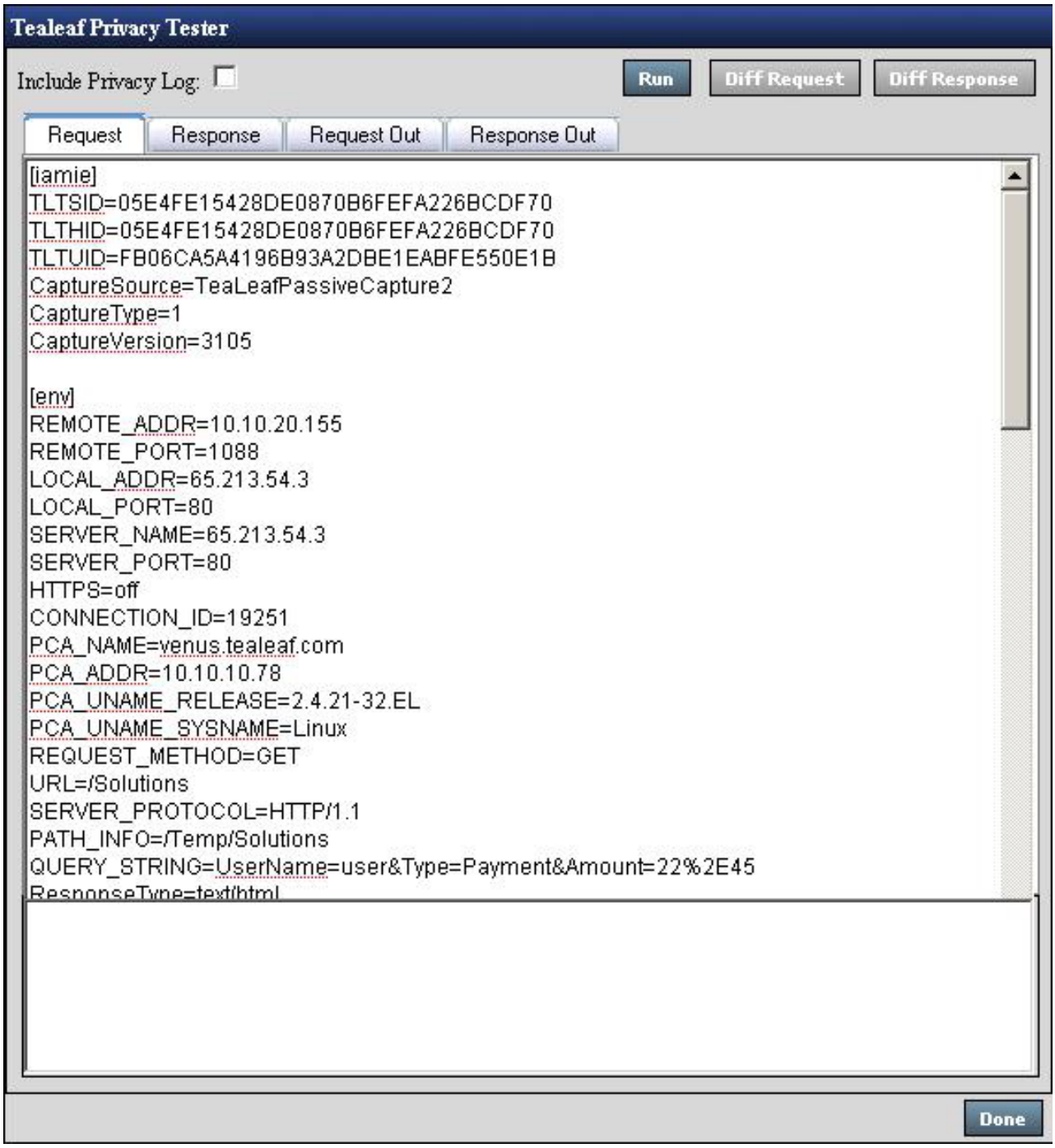


Figure 44. Privacy Tester

When the Privacy Tester is started, the Request tab and the Response tab are pre-populated with a sample request and a sample response.

- You can copy and paste other data to test into either tab. See "Acquiring Sample Data" on page 394.

When it is run, Privacy Tester creates a Tealeaf `.tla` file containing the initial request and response. This file is pushed to the ArchiveReader, which then applies the Privacy rules and outputs the modified `.tla` file for the Privacy Tester to display.

Privacy Tester Workflow:
Here's the suggested workflow.

1. By default, Privacy Tester populates the Request and the Response tab with sample data. However, to test specific rules, you may need to configure your own sample data. You may copy and paste any sample data into the Request and Response tabs. If desired, acquire sample data. See "Acquiring Sample Data."
2. Make changes to your privacy rules in the appropriate editor in TMS. See "Editing Rules" on page 395.
3. From the editor, open the Privacy Tester. See "Starting Privacy Tester" on page 391.
4. You can use standard copy and paste commands to populate these tabs with real hit data.

   Note: Privacy Tester does not save the contents of the Response and Request tabs. You may want to save your sample data to a text file outside of the utility.
5. To include privacy logging information, select the Include Privacy Log checkbox. This option is not available in Privacy Tester for RTA. See "Privacy Logs" on page 401.
6. Run the Privacy Tester. See "Running Privacy Tester" on page 395.
7. Review the results in the output tabs. See "Reviewing Results" on page 397.
8. Iterate on the above steps until you are satisfied with the results.
9. If the rule changes are working, you may save the edited configuration file through TMS. See "Saving" on page 402.

Acquiring Sample Data

While Privacy Tester does pre-populate the Request and Response tabs with data when it is launched, you should provide sample data that specifically tests the rules you are creating. If the sample data does not contain data that is identified and evaluated by your rules, the output results may show no changes for rules that would make changes to detected data.

Note: It is important to gather sample data that will be specifically exercised by the rules in development. You should review the request and response data in detail to verify that it meets your testing criteria.

You can acquire sample request and response data from sessions available through Browser-Based Replay or through RTV.

Note: If you are pasting an entire response buffer from RTV, please make sure that the `HTTP:` line is the first line in the response. RTV inserts extra lines for proper operation, but they may cause problems for the Privacy Tester utility.

- The standalone IBM Tealeaf CX RealiTea Viewer application enables replay functionality and provides views for request and response data from the Windows desktop.
  - See "RealiTea Viewer - Request View" in the *IBM Tealeaf RealiTea Viewer User Manual*.
  - See "RealiTea Viewer - Response View" in the *IBM Tealeaf RealiTea Viewer User Manual*.
- Browser-Based Replay enables the replay of Tealeaf sessions through the Portal. Through BBR, you can replay sessions and review request and response data. See "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual*.

If you are testing a response that is an XML document, it does not contain a header. Privacy Tester attempts to interpret this data as an HTML document; without a properly defined header, it is invalid HTML, and Privacy Tester fails.

To test an XML response:

1. In RTV, select **View** > **Show HTTP Headers**.
2. To view the full response, click the RSP button.
3. Copy the entire XML text, including the headers.
4. Paste the entire text into the response tab of the Privacy Tester.
5. Test the data against your defined set of rules.

Editing Rules

You edit rules and launch the Privacy Tester through the appropriate configuration in TMS.

Note: The configuration does not appear in TMS until you have added it to your pipeline through the Pipeline Editor. See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

For more information on editing rules:

- “Privacy Session Agent” on page 291
- “Extended Privacy Session Agent” on page 261
- “Real-Time Monitoring and Alert (RTA) Session Agent” on page 321

After you edit the rules, you can open the Privacy Tester from the configuration and test the rules immediately.

Note: You do not have to save the file to test the privacy rules through the utility.

See “Starting Privacy Tester” on page 391.

Running Privacy Tester

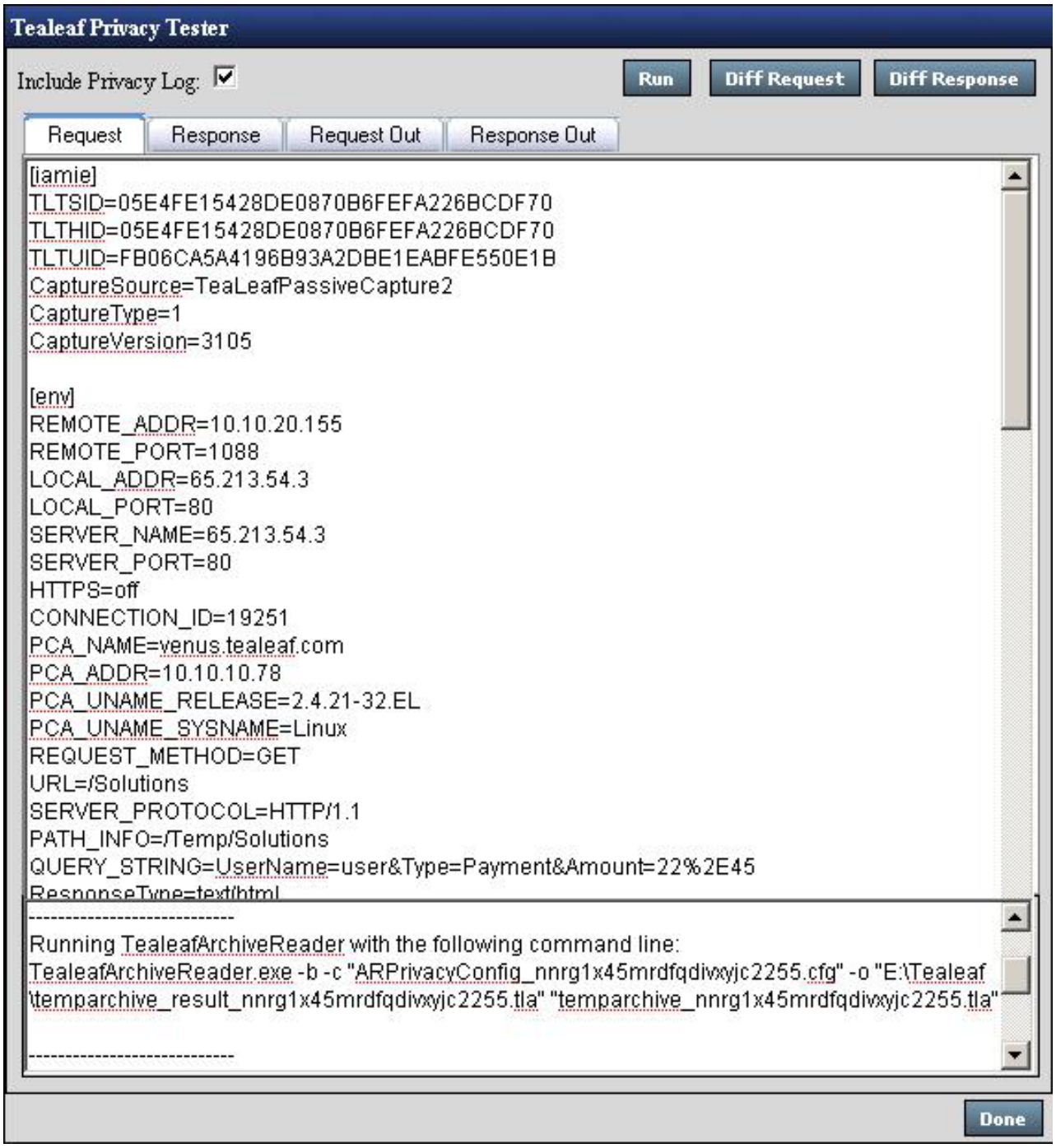


Figure 45. Executing Privacy Tester

1. If you have not done so already, you should paste in sample request and response data and edit your rules.
   - See "Acquiring Sample Data" on page 394.
   - See "Editing Rules" on page 395.
2. To include privacy logging information, select the Include Privacy Log checkbox. This option is not available in Privacy Tester for RTA. See "Privacy Logs" on page 401.
3. To run the selected privacy rules against the text in the Request and Response tabs, click **Run**.

- During execution, logging information is displayed in the Status pane.

4. When the test has completed, you can review the output. See "Reviewing Results" below.

Reviewing Results

After the test has completed, click the Request Out or Response Out tab to see the output results.

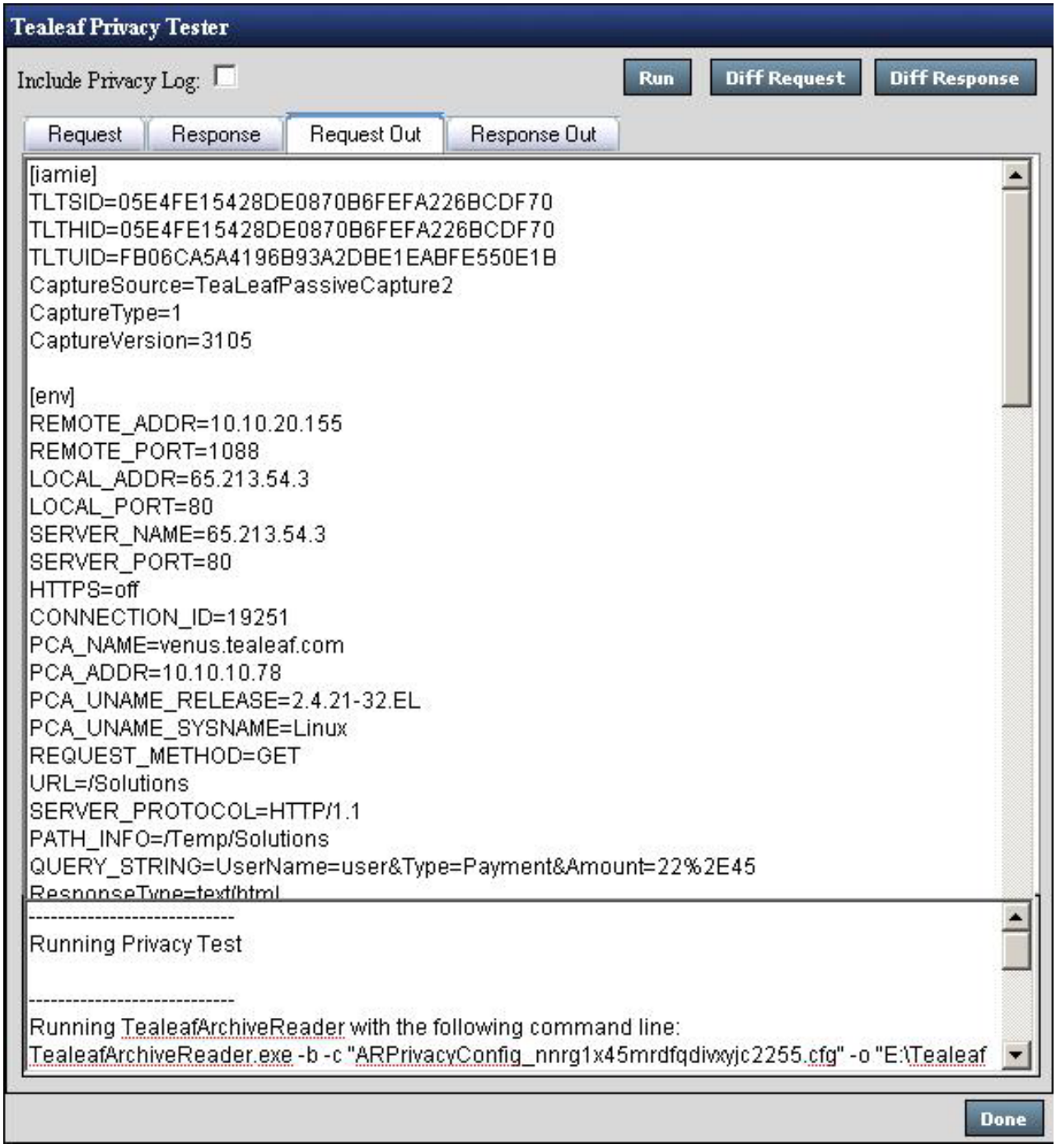


Figure 46. Request Out tab

After running Privacy Tester, you can compare the differences in the request and response samples between the input sample data and the output results.

- To compare the input and output requests, click **Diff Request**.
- To compare the input and output responses, click **Diff Response**.

When the differences are displayed, you can review results side-by-side or as a single merged piece of text.

- **Unified View** - In Unified view, you can review the changes between input and output of the request or response in a single pane. See "Unified View" on page 399.
- **Side-by-Side View** - In Side-by-Side view, you can review the changes between input and output in separate panels. See "Side-by-Side View."

Side-by-Side View

In Side-by-Side view, the input request or response text is listed on the left side and the output on the right side with line numbers displayed to help to match up changes.

- You can copy data from either pane. Select the data and press `CTRL+C`.

In the image below, items that have been removed appear in gray, while replacement text in the output appears in blue on the right side.

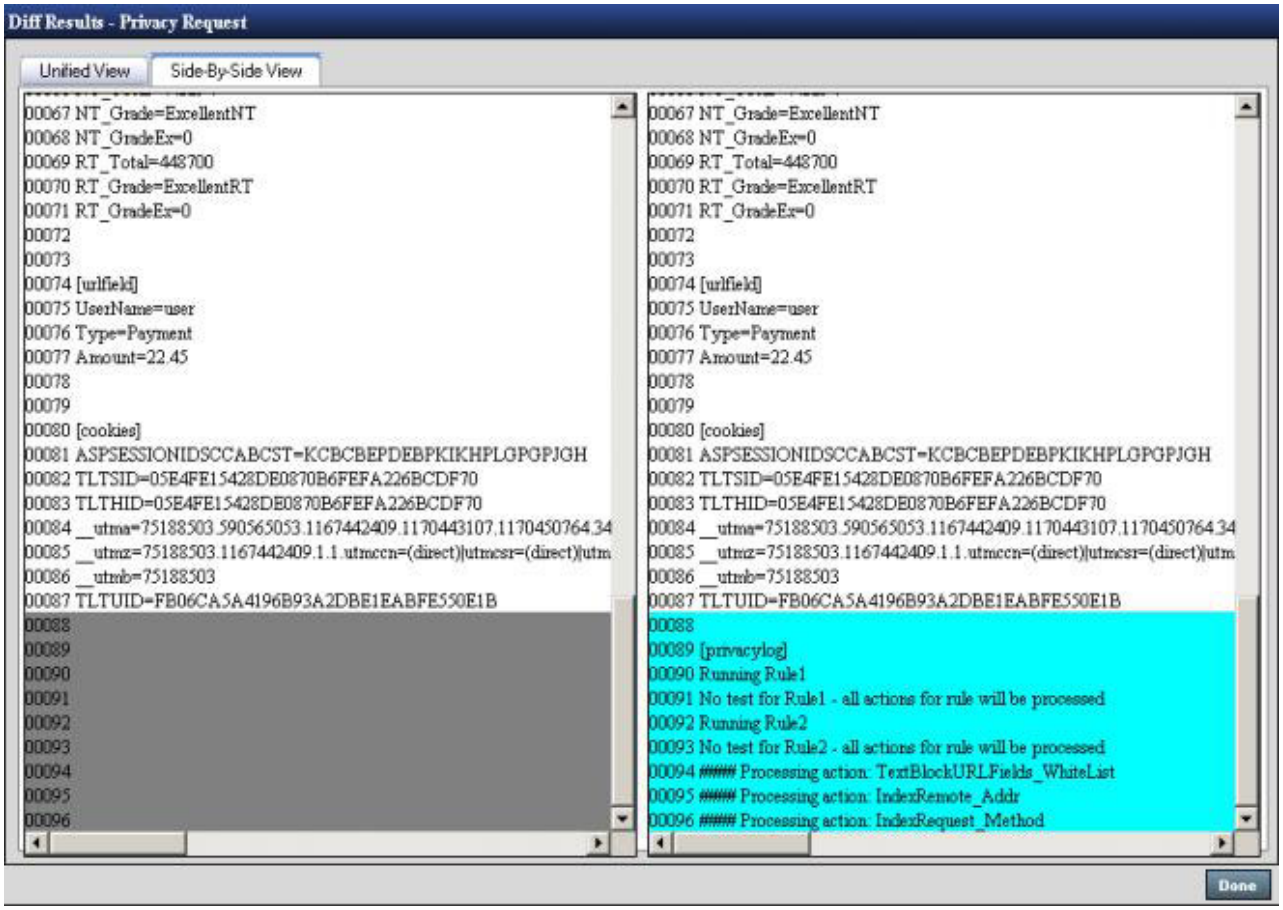


Figure 47. Side by Side View

Side-by-side view differences

Change
Identifier

Added lines
pre-test version: gray background
post-test version: blue background

Deleted lines
pre-test version: red background
post-test version: gray background

Updated lines
pre-test version: red background
post-test version: blue blackground

Unified View

In Unified view, you can review differences between the input response or request and the output in the same panel.

- To copy data, select the data and press `CTRL+C`.

In the image below, items that have been removed by the rules appear in red, while replacement text in the output appears in blue.

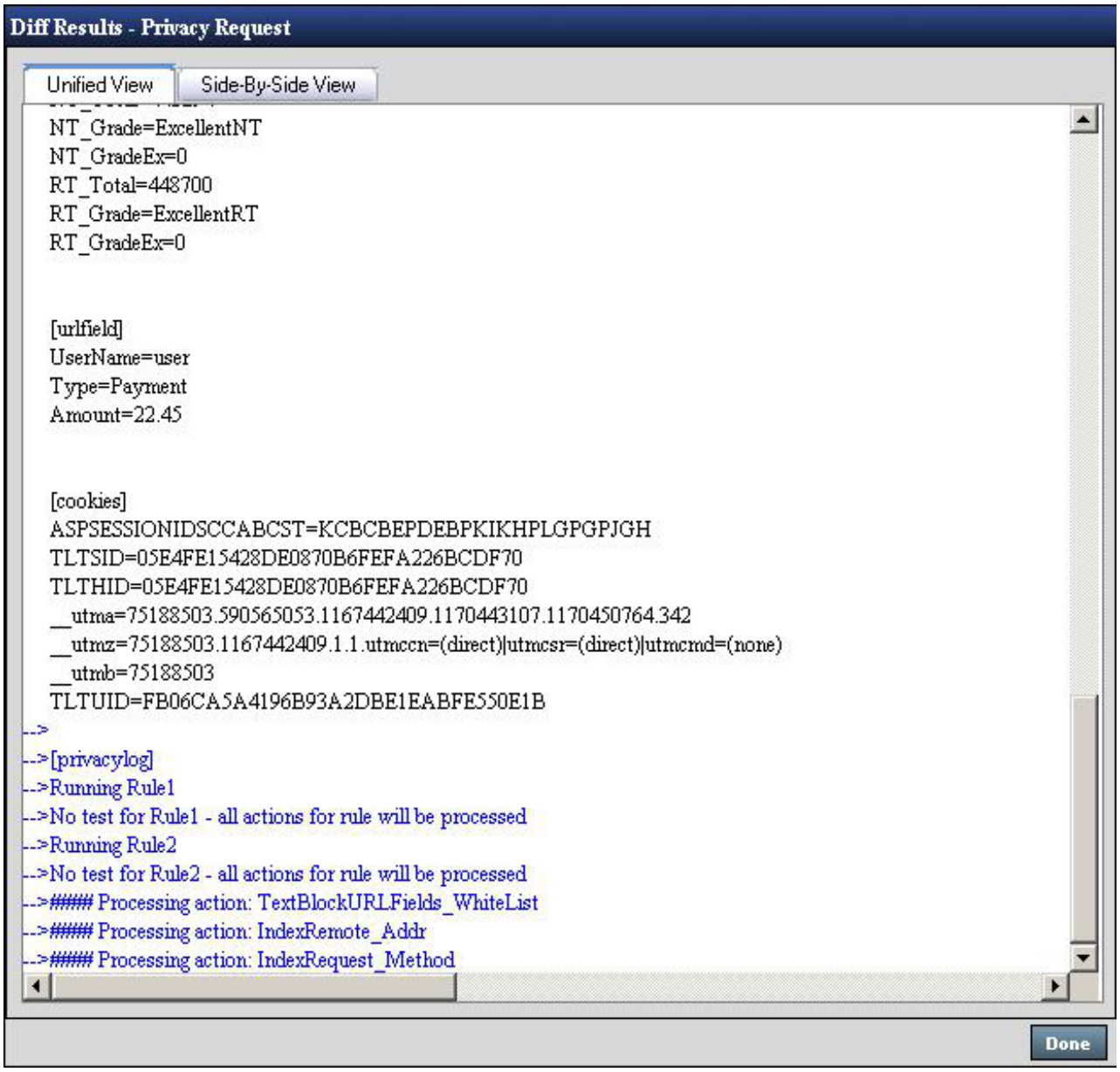


Figure 48. Unified View

Unified view differences

Change
Identifier

Added lines
blue text

Deleted lines
red text

Updated lines
old line: red text
new line: blue text

Privacy Logs

During execution, logging information generated by the session agent is displayed in the Status pane. Optionally, you can choose to include the privacy logging information generated by the session agent at the bottom of the generated output.

- To include privacy logging information, select the Include Privacy Log checkbox.

  Note: Including the Privacy Log is not available in the RTA version of Privacy Tester.

In the output, the log information is displayed under the `[privacylog]` section of the output, as in the image below:

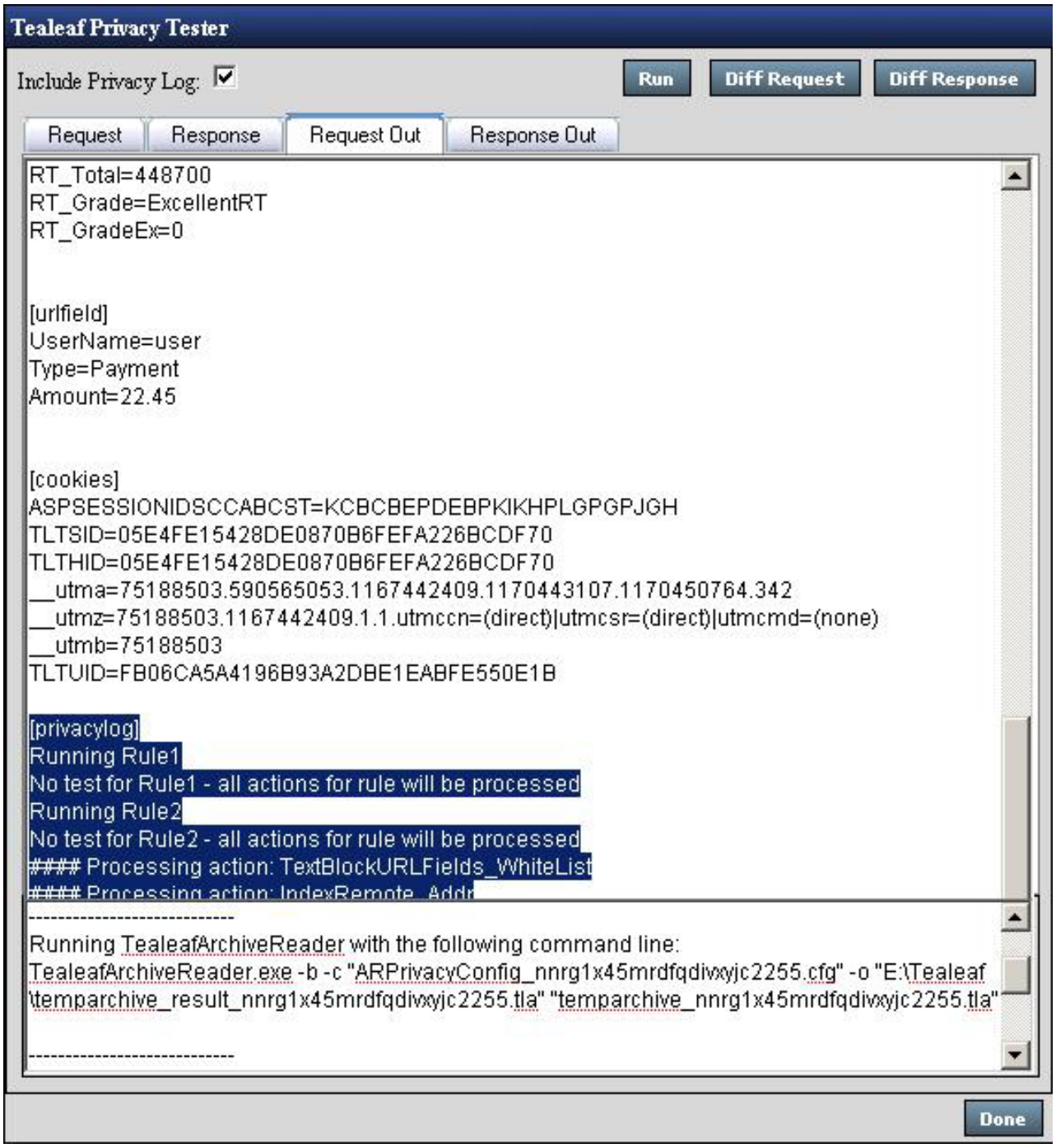


Figure 49. Privacy Log in Request Output

Note: All errors in the privacy configuration are logged to the Windows Application Event Log. See the Windows Application Event Log to verify that the Privacy Tester has not reported any errors.

Saving

If you are satisfied with the results of your privacy tests, you can save the configuration that you have edited through TMS. See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Chapter 5. IBM Tealeaf documentation and help

IBM Tealeaf provides documentation and help for users, developers, and administrators.

Viewing product documentation

All IBM Tealeaf product documentation is available at the following website:

https://tealeaf.support.ibmcloud.com/

Use the information in the following table to view the product documentation for IBM Tealeaf:

Table 44. Getting help

To view...	**Do this...**
Product documentation	On the IBM Tealeaf portal, go to **?** > **Product Documentation**.
Help for a page on the IBM Tealeaf Portal	On the IBM Tealeaf portal, go to **?** > **Help for This Page**.
Help for IBM Tealeaf CX PCA	On the IBM Tealeaf CX PCA web interface, select **Guide** to access the *IBM Tealeaf CX PCA Manual*.

Available documents for IBM Tealeaf products

Use the following table to view a list of available documents for all IBM Tealeaf products:

Table 45. Available documentation for IBM Tealeaf products

IBM Tealeaf products	**Available documents**
IBM Tealeaf CX	• *IBM Tealeaf Customer Experience Overview Guide* • *IBM Tealeaf CX Client Framework Data Integration Guide* • *IBM Tealeaf CX Configuration Manual* • *IBM Tealeaf CX Cookie Injector Manual* • *IBM Tealeaf CX Databases Guide* • *IBM Tealeaf CX Event Manager Manual* • *IBM Tealeaf CX Glossary* • *IBM Tealeaf CX Installation Manual* • *IBM Tealeaf CX PCA Manual* • *IBM Tealeaf CX PCA Release Notes*

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Table 45. Available documentation for IBM Tealeaf products (continued)

IBM Tealeaf products	Available documents
IBM Tealeaf CX	• *IBM Tealeaf CX RealiTea Viewer Client Side Capture Manual* • *IBM Tealeaf CX RealiTea Viewer User Manual* • *IBM Tealeaf CX Release Notes* • *IBM Tealeaf CX Release Upgrade Manual* • *IBM Tealeaf CX Support Troubleshooting FAQ* • *IBM Tealeaf CX Troubleshooting Guide* • *IBM Tealeaf CX UI Capture j2 Guide* • *IBM Tealeaf CX UI Capture j2 Release Notes*
IBM Tealeaf cxImpact	• *IBM Tealeaf cxImpact Administration Manual* • *IBM Tealeaf cxImpact User Manual* • *IBM Tealeaf cxImpact Reporting Guide*
IBM Tealeaf cxConnect	• *IBM Tealeaf cxConnect for Data Analysis Administration Manual* • *IBM Tealeaf cxConnect for Voice of Customer Administration Manual* • *IBM Tealeaf cxConnect for Web Analytics Administration Manual*
IBM Tealeaf cxOverstat	*IBM Tealeaf cxOverstat User Manual*
IBM Tealeaf cxReveal	• *IBM Tealeaf cxReveal Administration Manual* • *IBM Tealeaf cxReveal API Guide* • *IBM Tealeaf cxReveal User Manual*
IBM Tealeaf cxVerify	*IBM Tealeaf cxVerify Administration Manual*
IBM Tealeaf cxView	*IBM Tealeaf cxView User Manual*
IBM Tealeaf CX Mobile	• *IBM Tealeaf CX Mobile Android Logging Framework Guide* • *IBM Tealeaf Android Logging Framework Release Notes* • *IBM Tealeaf CX Mobile Administration Manual* • *IBM Tealeaf CX Mobile User Manual* • *IBM Tealeaf CX Mobile iOS Logging Framework Guide* • *IBM Tealeaf iOS Logging Framework Release Notes*

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